WIRE AND WIRE PRODUCTS

JUNE 1940

OUR JOB IS TO HELP YOU

improve your present line of products
speed acceptance of your new products

BY PRODUCING BETTER STEEL WIRE FOR YOUR JOBS

Whether you use spring wire, cold-heading wire or bright basic wire in the manufacture of your products, we, here at J & L, are ready to help you with your problems of quality and production. Nowhere in the steel industry will you find closer teamwork among skilled workmen, quality-control metallurgists, development engineers, research scientists, service metallurgists and all branches of management, than we have here at J & L... all working in harmony to produce better J & L Controlled Quality Steel Wire for your specific jobs.

Equipment of the latest design is used in all operations of wire making in the J & L mills. Pictured here is one of the new J & L precision wire drawing machines.

J&L STEEL

JONES & LAUGHLIN STEEL CORPORATION

AMERICAN IRON AND STEEL WORKS • PITTSBURGH, PENNSYLVANIA

OFFICIAL PUBLICATION OF THE WIRE ASSOCIATION

THE METAL of THE HOUR

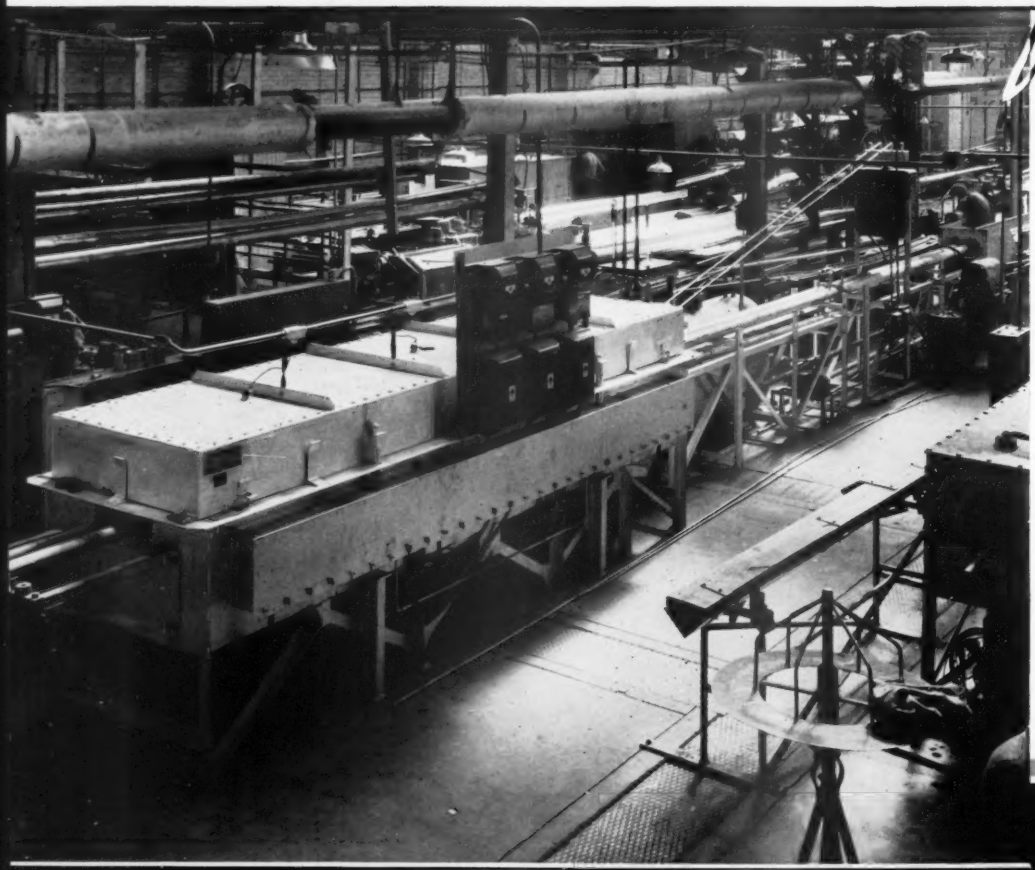
Stainless Steel

BRIGHT ANNEAL IT IN DREVER FURNACES

(GAS—ELECTRICITY—OIL)

And ELIMINATE PICKLING & POLISHING

BRIGHT ANNEALING FURNACES *for*



Bright Annealing Furnace for Stainless Steel Tubing.
J. Bishop & Co. Platinum Works, Malvern, Pa.

- Stainless WIRE
- Stainless SEAMLESS TUBING
- Stainless FLAT and SHAPED WIRE
- Stainless STAMPINGS

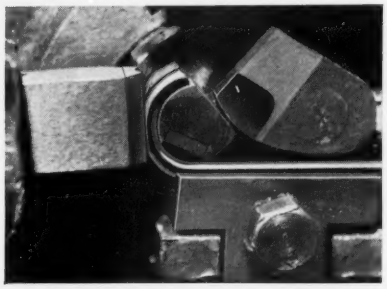
All Types of Stainless Steels Successfully Bright Annealed

Phone, Wire or Mail Inquiries to

THE DREVER COMPANY
748 E. Venango Street
PHILADELPHIA, PA.

2,130 Miles of Wire Coiled With Carboloy Point

L. A. Young Spring and Wire Corporation, Detroit, reports that on one Carboloy coiling point they coiled more than 11,250,000 ft. of 7½ gage Swedish commercial type "OT" valve spring wire. In this plant Carboloy Points average 30 times the life of High Speed Steel points per refinish and require only one-half the time it takes to refinish H. S. S. points. Due to the extra amount of



stock removed in refinishing H. S. S. points, Carboloy outlasts H. S. S. 500 to 1 per inch of wear. Carboloy-tipped pitch tools and arbors outwear H. S. S. at approximately the same ratio. This performance is indicative of the results obtained by this company in coiling various sizes of steel wire from .008″ dia. to $\frac{1}{16}$″ dia. for such products as automobile seats, clutch springs, brake springs, window regulator springs, mattress springs, etc.

A Simple Method for Producing Higher Polish on Carbide Dies . . .

The common method employed for polishing Carboloy dies is to use a dowel pin or hard wood stick applying diamond powder to the stick or to the Carboloy surface to be polished. The die is then rotated and pressure applied to the stick to obtain the polish.

While this method is quick and gives a fair polish, improved results are said to be obtained by the use of the following alternative procedure.

After the first polishing operation has been completed, the lapping stick is used again by wrapping a thin layer of absorbent cotton around the stick. Apply a mixture of oil and No. 6 diamond powder. The mixture should be quite thin. Only a small amount of the mixture is necessary and is applied to the cotton in a thin line longitudinally.

The part is again rotated and the polishing continued, using the cotton with oil applied. Very little pressure should be used at this point. Within a few minutes the polish is brought to a much higher degree of finish than is possible when heavy pressures are used.

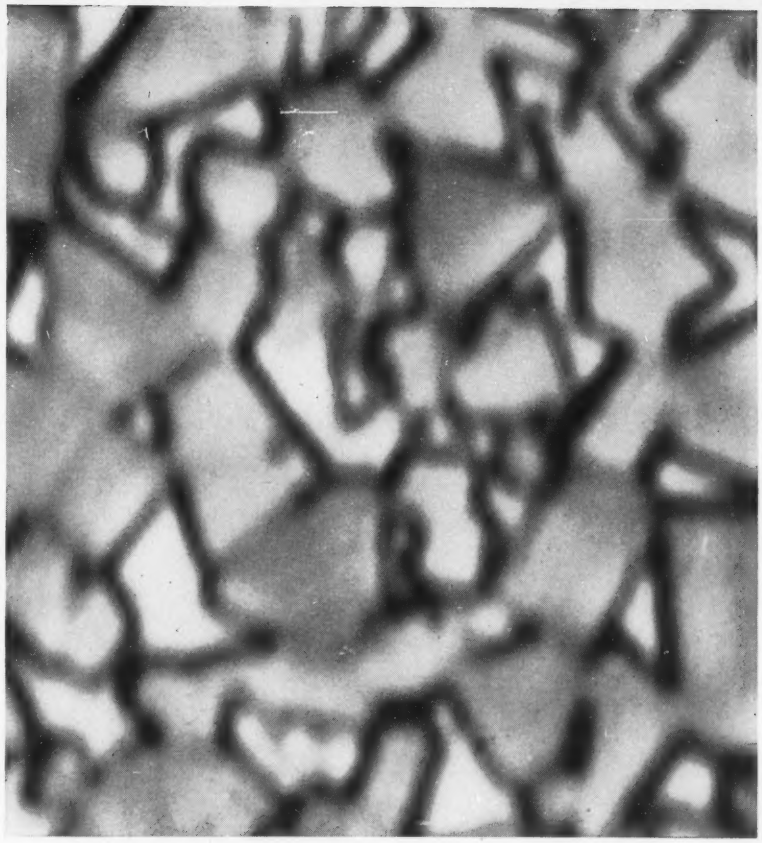
Correction—

In this column in the May issue a $\frac{1}{32}$″ back relief was recommended for sizes 0 to .062″. This should have read: "For sizes .025″ to .062″."

For sizes smaller than .025″ the back relief should be as deep as is consistent with good practice in rough drilling and sizing. Usually it is possible to hold this depth from .010″ to .015″ on dies .008″ to .025″.

Carboloy Masonry Drills

Your maintenance man would like to know about the Carboloy Masonry Drill. Drills concrete, brick, tile, etc., 75% faster than old methods. Ask for leaflet GT-103.



The Private Lives of 100 *Trillion* Particles

What happens to the carbide particles when cemented carbides are processed? What is the distribution of carbide particle and binder content? How do varying percentages of tungsten, tantalum and titanium carbide affect the physical characteristics of cemented carbide? . . . The answer to countless questions of this nature are the answers the metallurgists in the Carboloy Research Laboratories constantly seek, and find, in order that you, the user, may receive the finest in cemented carbide quality.

The work of the Research "Lab" involves many factors. It deals with the determination of correct heat, kind and percentage of binder, particle size, selection of proper tungsten, tantalum or titanium carbide content, microscopic examination of structure, enlarged at times greater than 10,000 times (as shown above), etc. It deals with countless possible variations of a material composed of approximately 100 trillion particles to each pound—100 trillion particles compressed and bonded together within a space of less than two cubic inches.

There is much that is known about cemented carbide, much more still to be learned. Through the work now being carried on, we believe that the value you receive from cemented carbide will steadily increase with each passing year.

CARBOLOY COMPANY, INC., 11171 E. 8-Mile Ave., DETROIT, MICHIGAN

CHICAGO • CLEVELAND • NEWARK • PITTSBURGH • PHILADELPHIA • WORCESTER, MASS.

Authorized Distributors: Canadian Gen. Elec. Co., Ltd., Toronto • Hartley Wire Die Co., Waterbury, Conn.

CARBOLOY

REG. U.S. PAT. OFF.

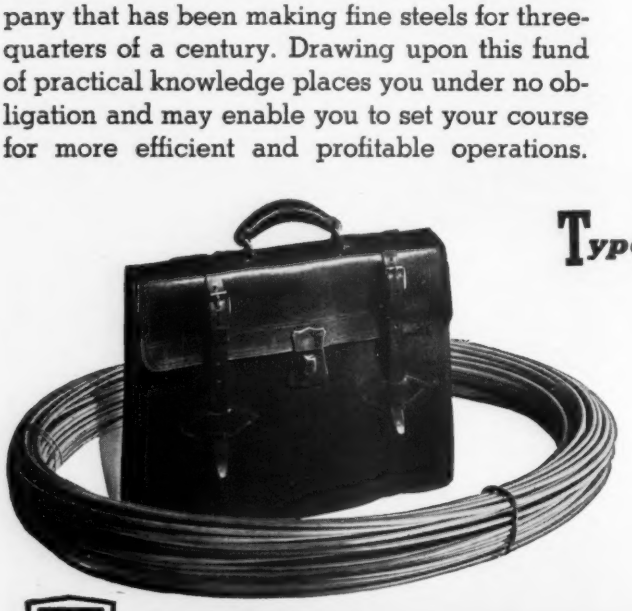
TUNGSTEN CARBIDE—TANTALUM CARBIDE—TITANIUM CARBIDE

FOR CUTTING, DRAWING, SHAPING, EXTRUDING METALS AND NON-METALLICS
★ FOR REDUCING WEAR ON EQUIPMENT OR PRODUCTS YOU USE OR MAKE ★

Bethlehem backs up quality rods with expert service

REGARDLESS of the location of your plant or the character of your rod-and-wire problem, you can count on prompt helpful service from Bethlehem's staff of field engineers.

These men have a firm grasp of both steel-making practice and of difficult re-drawing or fabricating problems. To call in a Bethlehem engineer automatically enlists for you the research facilities and vast experience of a company that has been making fine steels for three-quarters of a century. Drawing upon this fund of practical knowledge places you under no obligation and may enable you to set your course for more efficient and profitable operations.



Types of Bethlehem rods available:

Basic- or acid-open-hearth, or Bessemer steel rods in a wide range of analyses can be obtained patented, annealed, normalized or spheroidized. These rods are furnished "as-rolled"; cleaned and lime-coated; cleaned and oiled; cleaned limed and oiled.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY

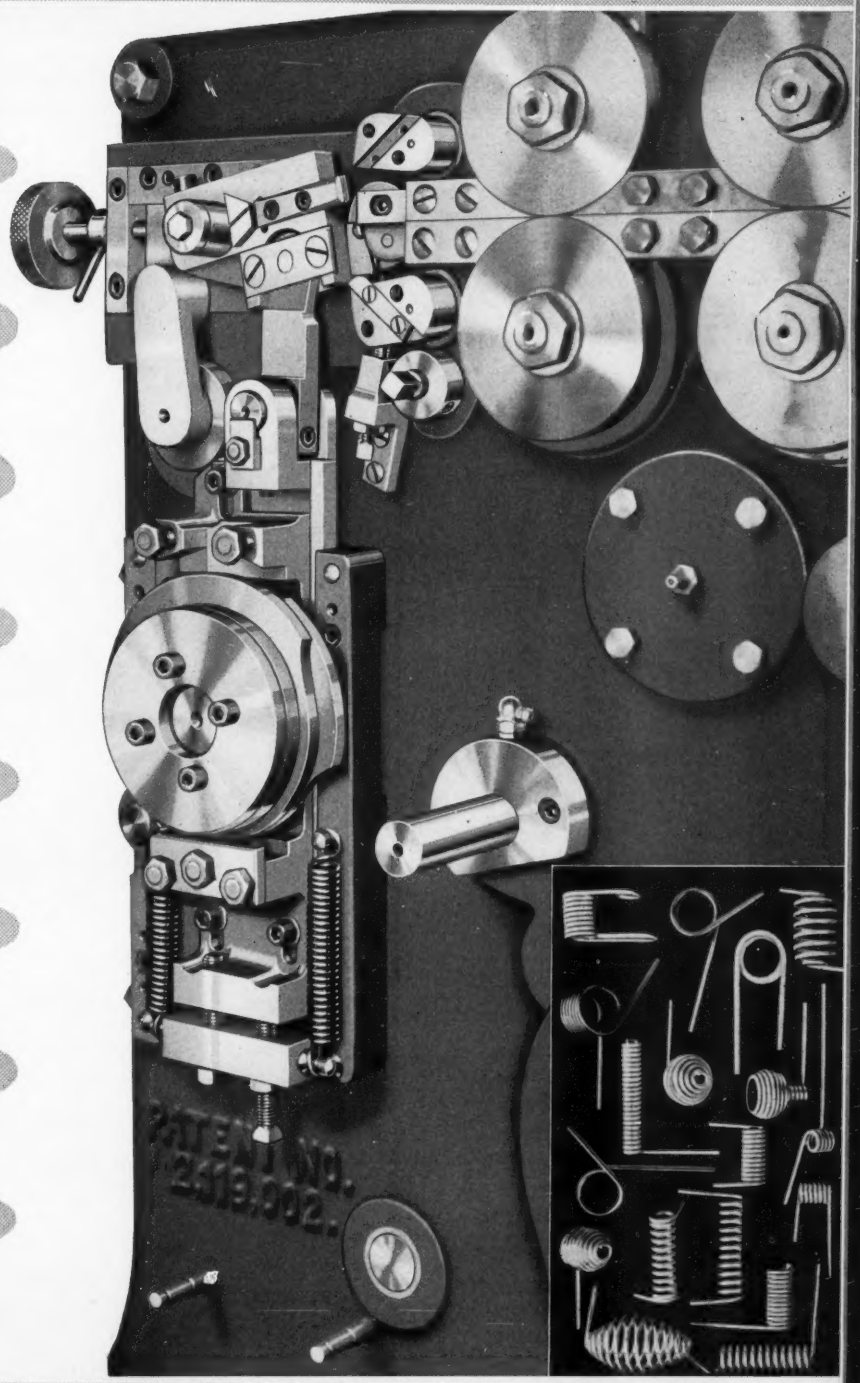
NOW Torsion Springs on a "Universal" Type Spring Coiler

Patent Number 2170984
Other Patents Pending

The Torrington Torsion Spring Attachment . . . a new and patented device for making torsion springs on Torrington "Universal Type" Spring Coilers . . . consists of a cam-actuated coiling point which can be timed to swing into, and out of, coiling position at the beginning and end of each coiling cycle. The only other necessary tooling is an arbor which moves vertically to sever the wire. Length of ends is controlled by the relation of the cams which bring the coiling point into, and out of, position.

Investigate TODAY what Torrington Spring Machines . . . and the new Torrington Torsion Spring Attachment . . . can do for YOU in stepping-up profits through their ability to produce more springs per machine hour, formed to a new high degree of accuracy, with fewer rejections and better satisfied customers.

THE TORRINGTON MFG. CO.
Torrington, Connecticut, U. S. A.



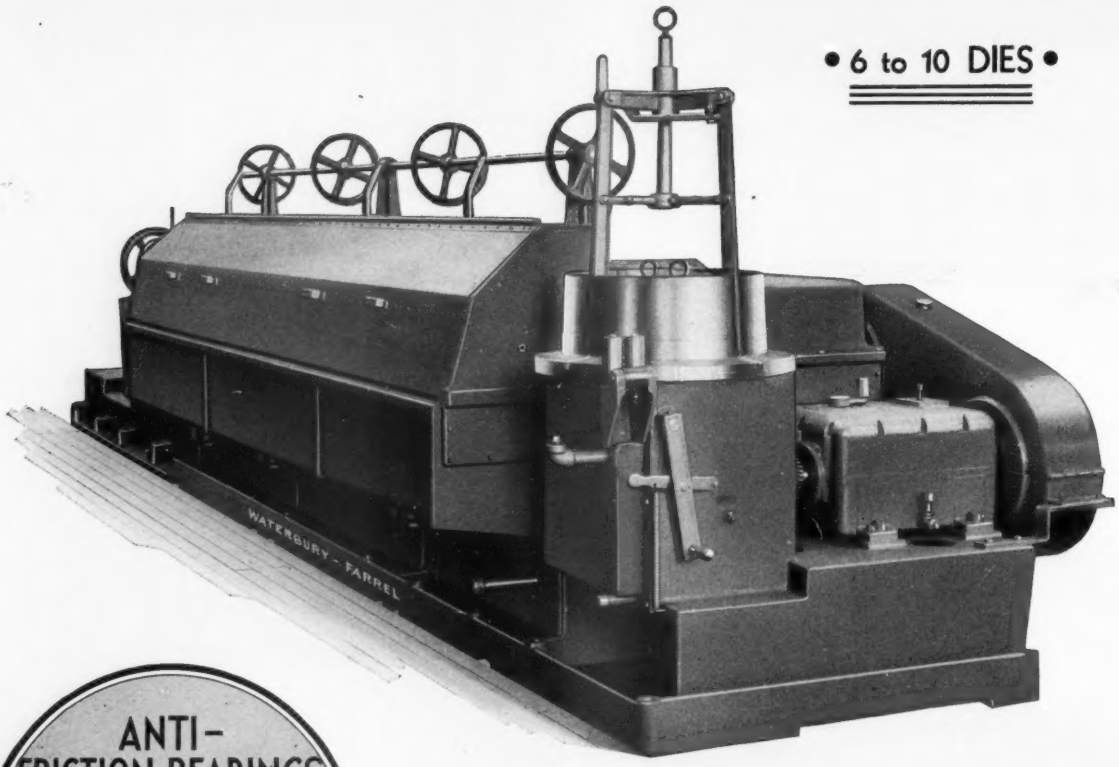
Spring Machines by

TORRINGTON

WATERBURY-FARREL

NO. 1 TANDEM WIRE DRAWING MACHINE - FOR BRASS OR COPPER

• 6 to 10 DIES •



ANTI-
FRICTION BEARINGS
FORCED
FEED LUBRICATION
SPIRAL
BEVEL GEARING

Change gearing provides four finishing speeds with a single speed AC main motor.

Block driven through a clutch which may be disengaged to permit rotation by hand.

THE WATERBURY FARREL FOUNDRY AND MACHINE COMPANY

WATERBURY, CONNECTICUT U.S.A.

CLEVELAND CHICAGO NEWARK, N. J.

FOR
1940
TANTALUM
CARBIDE

ESSENTIAL
For Drawing Steel Wire

TANTALUM CARBIDE cutting tools outperform all other carbides in machining steel. It is not exaggerating to state that of all carbide tools used to machine steel, at least 90% contain Tantalum Carbide.

The same properties which make Tantalum Carbide the outstanding steel cutting material enable Tantalum Carbide Dies to outperform other carbides.

For finer finish and longer life, Vascoloy-Ramet Tantalum Carbide Dies have never been equaled.

In 1940, progress demands Tantalum.

Vascoloy

RAMET

TANTALUM-TUNGSTEN CARBIDE

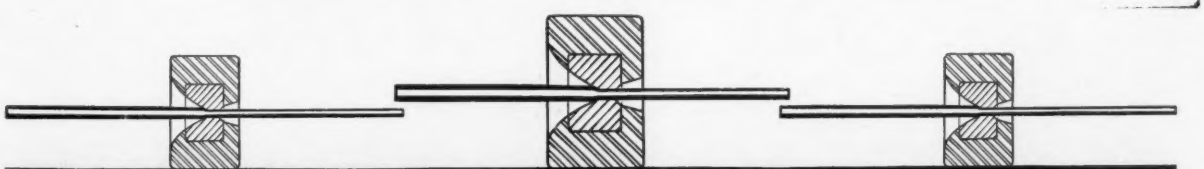
DIES

VASCOLOY-RAMET CORPORATION

NORTH CHICAGO, ILLINOIS

JERSEY CITY DETROIT CLEVELAND PITTSBURGH HARTFORD PROVIDENCE PHILADELPHIA

In Canada: Carbide Tool & Die Company, Ltd., Hamilton, Ont.



COP-R-DRAW TUF-DRAW FER-O-DRAW

Pittsburgh Wires

A COMPLETE LINE

FOR ALL FABRICATING NEEDS

STAINLESS STEEL WIRES • COLD HEADING WIRE • SPRING WIRE

CHAIN WIRE • WELDING WIRE • WEAVING WIRE • TINNED WIRE

STAPLING WIRE • POT, SALT AND LEAD ANNEALED WIRE • LINK WIRE

BALE WIRE • CORE WIRE • COPPERED WIRE • FINE WIRE

FLAT WIRE • GALVANIZED WIRES • BOX BINDING WIRE

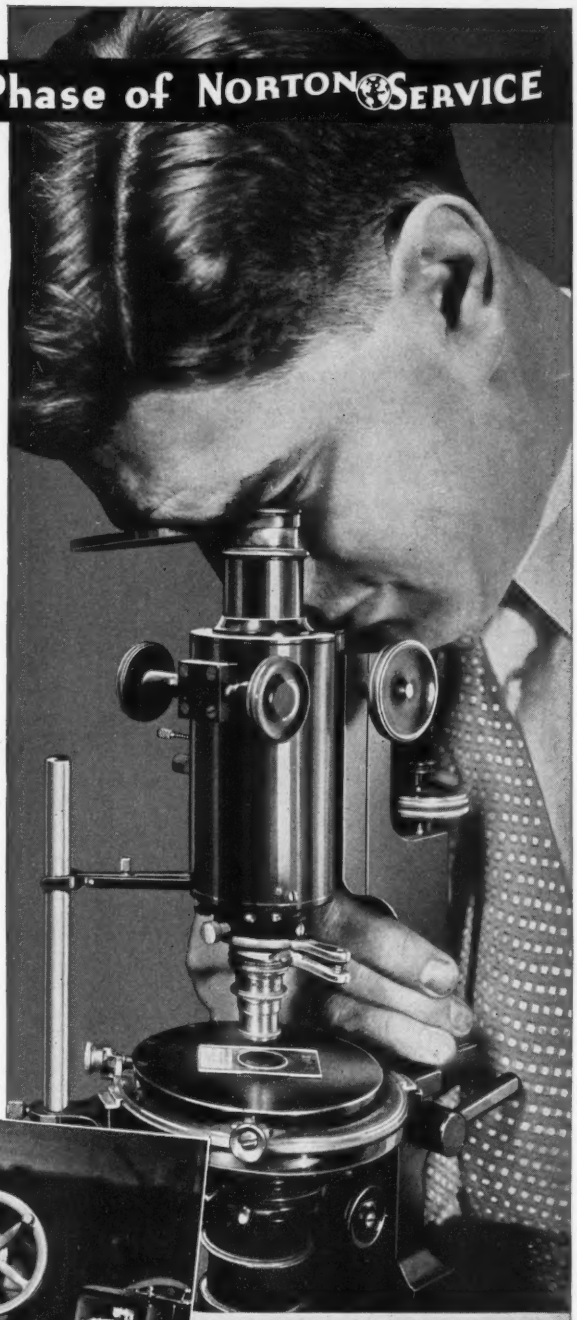
PITTSBURGH STEEL COMPANY

1641 GRANT BUILDING PITTSBURGH, PA.

P

RESEARCH . . . Another Phase of NORTON SERVICE

HELPS YOU IN TWO IMPORTANT WAYS . .



Through Grinding Wheel Improvement

MANY of the fifty trained scientists and technicians in the Norton Laboratories are thinking chiefly of the future—are busy developing new abrasives, new bonds and improved manufacturing processes that you may have better grinding wheels tomorrow. It is their vision and skill that gave the grinding industry B-E bond, controlled structure, diamond wheels, I-R Crystolon abrasive, Norbide (Norton Boron Carbide) and many other outstanding Norton developments.

Through Grinding Wheel Application

ANOTHER part of the laboratory staff specializes on the immediate present—on solving customers' current grinding problems. Practical laboratory engineers cooperate with Norton distributors, representatives and field engineers to determine by actual tests, both in the laboratories and in the customer's plant, the correct wheels and grinding procedure.

You can depend on Norton Service to solve your grinding problems.

W-787

NORTON COMPANY
WORCESTER, MASS.
New York Chicago Detroit
Philadelphia Pittsburgh Hartford
Cleveland Hamilton, Ont.
BEHR-MANNING DIVISION, TROY, N. Y.

NORTON ABRASIVES

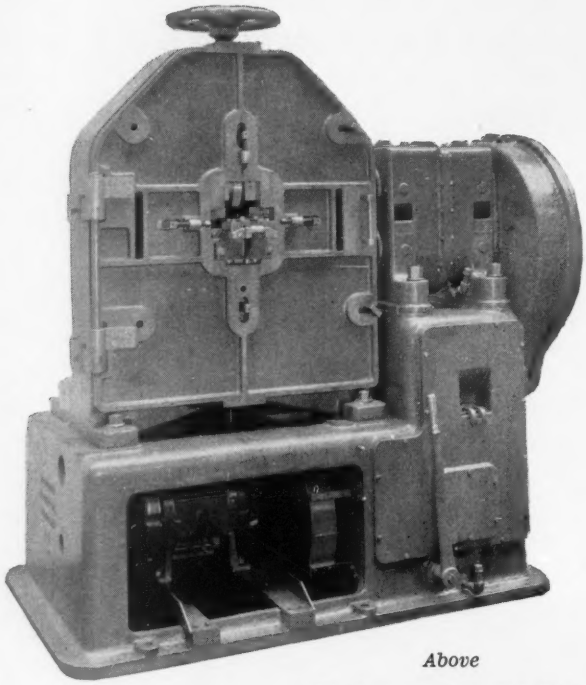
"STANDARD" TURKS HEADS

The fastest and most economical method of forming special shapes from round wire—and for embossing designs on wire.

"Standard" Turks Heads, or adjustable draw plates, efficiently replace solid dies in reducing and forming wire from the round to rectangular and special shapes.

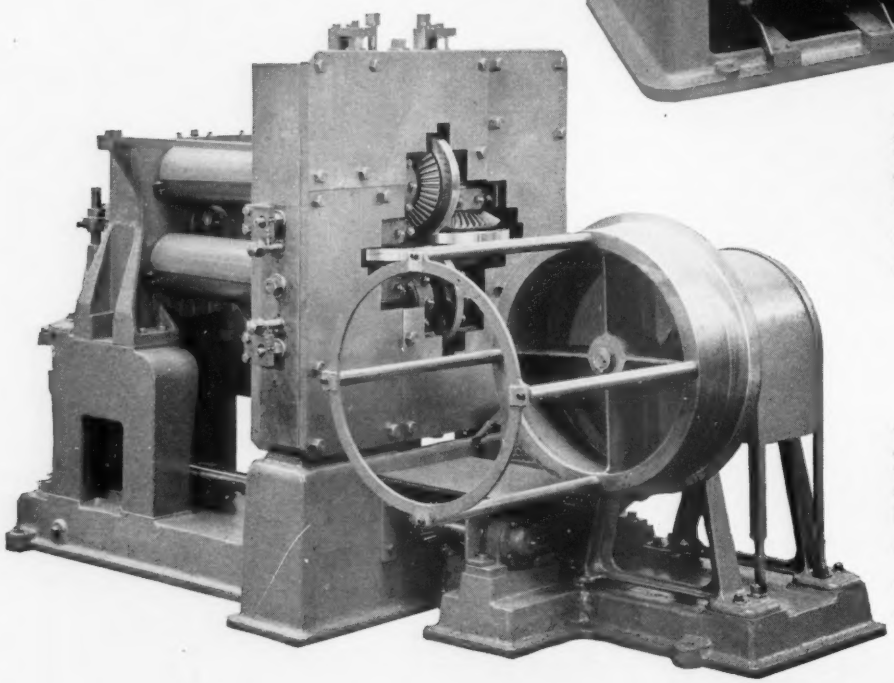
Turks Heads with friction rolls have been used for years and produce good surfaces with sharp corners and permit of adjustment to maintain an exact size of section.

Power Driven Rolls, now applied to the Turks Head, offer a higher rate of production, and eliminate the need for a bull block or draw bench for moving the wire through the draw plates.



Above

The Power Driven Plain Type Turks Head used for forming special shapes—with formed rolls — and for embossing designs on special shapes.



At Left

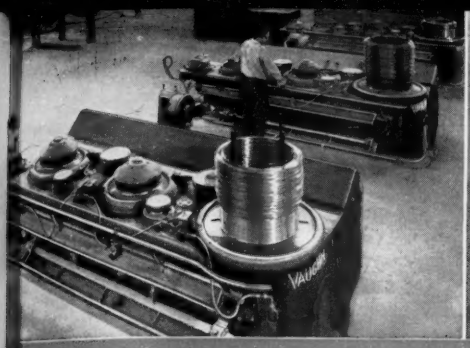
The Power Driven Universal Type—with flat rolls only—is used for converting round wire into rectangular shapes, allowing for a wide variation in section size.

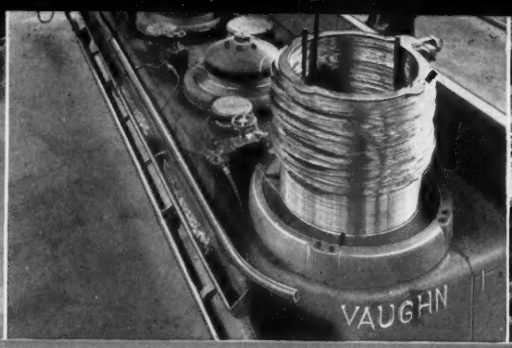
Write, stating your requirements (shape, stock, production, etc.) and we shall be glad to send specific recommendations, including price and delivery.

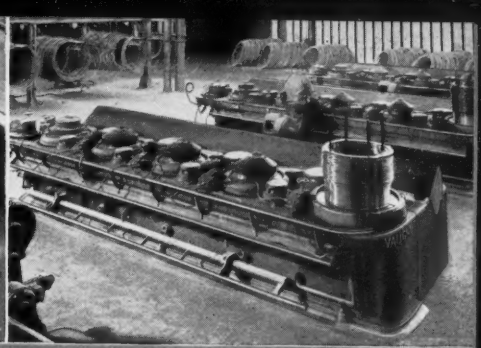
IT'S **STANDARD** PRACTICE

MACHINERY COMPANY

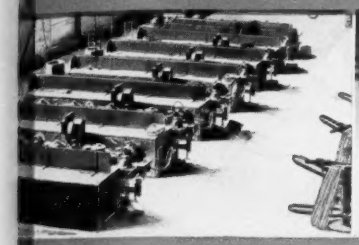
PROVIDENCE, RHODE ISLAND

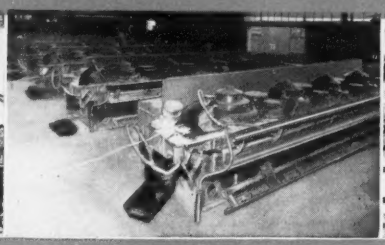




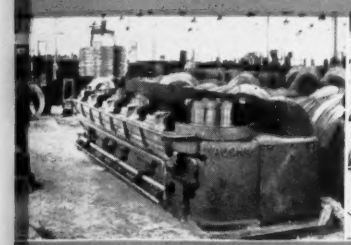


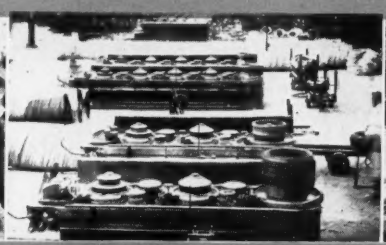
VAUGHN WIRE DRAWING MACHINERY



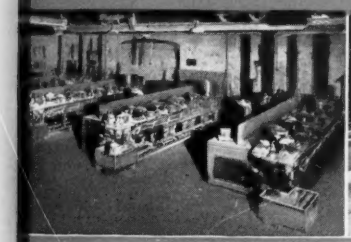


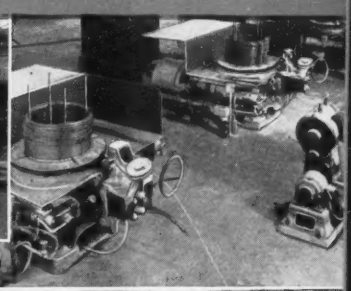
IS SELECTED FOR *SPEED*...



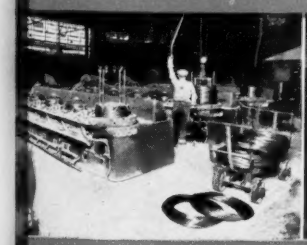


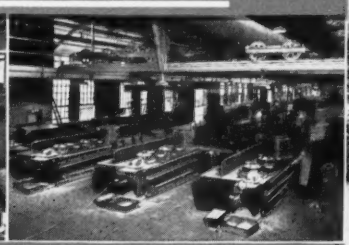
FLEXIBILITY...DEPENDABILITY...SAFETY





THAT SPELL LEADERSHIP





WHEREVER WIRE IS DRAWN!

VAUGHN

WIRE DRAWING MACHINERY

COMPLETE WIRE DRAWING EQUIPMENT . . . CONTINUOUS OR SINGLE HOLE . . . FOR THE LARGEST BARS . . . FOR THE SMALLEST WIRE . . . FERROUS, NON-FERROUS MATERIALS OR THEIR ALLOYS

THE VAUGHN MACHINERY COMPANY

CUYAHOGA FALLS, OHIO, U.S.A.

The Grass is Greener on the *Right* side

Continuous Wire Drawing Machines; Take-up Frames; Horizontal Bull Blocks; Vertical Spindle Bull Blocks; Reels; Pointers; Wire Mill Accessories.

MILES of fence wire mean tonnage — with the profits in pennies saved here and there.

Morgan Continuous Wire Drawing Machines save these pennies for you. They save them through a system of continuous wire drawing at high speed, with uninterrupted production, uniform quality. They save them in power and upkeep, in modern safety and efficiency.

The grass is greener for the wire mill equipped with Morgan Wire Drawing Machinery, because it is able to produce wire that is uniformly high in quality, with savings in cost that show profits in a competitive market.

MORGAN
WORCESTER
ENGINEERS AND MANUFACTURERS

MORGAN CONSTRUCTION COMPANY
WORCESTER, MASSACHUSETTS, U. S. A.

WIRE DRAWING MACHINERY

WIRE AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip, Wire and Rod Products and Insulated Wire and Cable

DRAWING—ROLLING—EXTRUDING—FORMING—FABRICATING

Vol. 15 JUNE, 1940 No. 6

Designated as

Official Publication By The Wire Association

Contents

Wire Association Stresses National Defense 301
Theme of Pittsburgh Regional Meeting is National Defense. Plant Inspection and Technical Discussions are described.

America Must Be Ready ..... By F. A. Westphal 304
Address delivered before Pittsburgh Regional Meeting of the Wire Association, May 17th, 1940.

Attendance List — Pittsburgh Regional Meeting 305

Keep Politics Out of Industrial Mobilization, By Richard E. Brown 307

Improvements in Wire and Rod Baking Practice, By J. M. Petix 307

The Best Fluxing Technique for Hot Dip Galvanizing ..... By Wallace G. Imhoff 312
A suggested improvement in the method of fluxing technique to improve the quality of the product and cut down the waste and losses involved in by-products.

American Iron & Steel Institute Statistics—First Quarter—1940 318

Outstanding Personalities of the Wire Industry 319

Exports and Imports of Wire 320

A Review of Recent Wire Patents 326

'Round the World with the Wire Industry 328

Index to Advertisers 337

Where to Buy 338-340

—ASSOCIATE EDITORS—

Kenneth B. Lewis, Consulting Wire Mill Engineer
W. H. Spowers, Jr., Consultant on Galvanizing
Lancaster, Allwine & Rommel, Consultants on Patent Information
European Correspondent
Paul Fidrmuc

Richard E. Brown, General Manager
R. S. Spengel, Business Manager

Publication Office: Washington, N. J.
Executive Office: Stamford Trust Co. Bldg., 300 Main St., Stamford, Conn.

Annual Subscription, U. S. $5.00, Canada $5.00

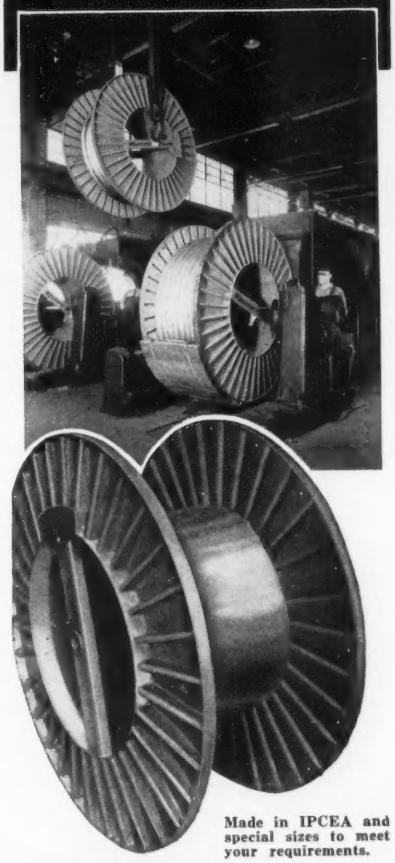
50 Cents a Copy in U. S. Issued Monthly Foreign, $7.50

October Convention Issue $1.00 a Copy
January Convention Discussions Issue $1.00 a Copy

Copyright 1940, Quinn-Brown Publishing Corp. WIRE AND WIRE PRODUCTS is fully protected by copyright and nothing that appears in it may be reprinted wholly or in part without permission.

WIRE & WIRE PRODUCTS, Vol. 15, No. 6, June, 1940. Executive Office, 300 Main St., Stamford, Conn. Published by the Quinn-Brown Publishing Corp., Richard E. Brown, President; R. S. Spengel, Secretary and Treasurer. Publication office, 13 West Church Street, Washington, N. J. Subscription price: U. S., $5.00; Canada, $5.00 per year, 50 cents per copy; Foreign, $7.50 per year. Entered as second class mail at the Post Office, Washington, N. J., under Act of March, 1879.

Stevens
LOW-TARE
Shipping Reels
and
FLANGED STEEL DRUMS



Made in IPCEA and special sizes to meet your requirements.

ALL STEEL Construction
PROVIDES
LOW WEIGHT and
LONG LIFE ECONOMIES

They are built to last—sturdy at the hub, and engineered with shock absorbing characteristics to withstand side stress. Write for interesting data and prices.

Manufactured under license arrangements with Western Electric Company, Incorporated

THE STEVENS METAL PRODUCTS CO.,
NILES, OHIO

"And coming events cast their shadow"

In aircraft production...

FIRTHALOY (SINTERED CARBIDE) DIES

give unequalled performance with undeviating accuracy!

In days ahead, when the tempo of production must be keyed to the demands of a manufacturing emergency, *only* the nearly diamond-hard qualities of FIRTHALOY Sintered Carbide Dies can maintain the *essential tolerances* and *undeviating accuracies* required for aircraft rivets, bolts, springs, and similar parts--when in continuous production, on uninterrupted schedules. FIRTHALOY Heading, Forming, Shaping and Drawing Dies have long enjoyed approval of prominent aircraft parts manufacturers. Full technical facts about these superior dies are available upon request from authorized Firthaloy Engineers. Investigate now!

FIRTH-STERLING QUALITY FIRTHALOY

FIRTH-STERLING STEEL COMPANY

OFFICE AND WORKS:
McKEESPORT, PA.

BRANCH WAREHOUSES:
NEW YORK CHICAGO
HARTFORD PHILADELPHIA
LOS ANGELES DAYTON
CLEVELAND DETROIT

WIRE AND WIRE PRODUCTS

A monthly publication devoted to the production of Wire, Rod and Strip.
Wire Products and Insulated Wire and Cable.
DRAWING --- ROLLING --- EXTRUDING --- FORMING --- FABRICATING

Vol. 15 JUNE, 1940 No. 6

Wire Association Stresses National Defense

The theme of Pittsburgh Regional Meeting was National Defense with addresses by F. A. Westphal and Major R. E. Brown.

Plant Inspection at Firth-Sterling Steel Company, Dinner and Technical Discussions are described here.

THE Pittsburgh Regional Meeting of the Wire Association drew about 200 members and guests to the William Penn Hotel. Most of them registered in time to take part in the first feature of the meeting—an inspection trip to the plant of the Firth-Sterling Steel Company, the only fully integrated producer of sintered tungsten carbides in the United States.

✦ ✦ ✦

THE interest of the inspecting group was centered on the manufacture of Firthaloy wire drawing dies at the company's Firthaloy Division. These dies, in use only a little more than a decade, have revolutionized wire drawing practice in all its phases. Their use made possible the present high-speed continuous wire drawing machinery and was responsible for the current practice of welding, resulting in greater production and lower costs.

✦ ✦ ✦

WIRE of every type and size has been improved in all respects by sintered carbide dies. Their use has brought about the close tolerances, gauge accuracies and bright finishes demanded by fabricators today. These improvements, together with lower production costs, have expanded old markets for wire and opened up new fields of use.

✦ ✦ ✦

IN making sintered tungsten carbides for dies, the first step is the milling and pulverizing of tungsten and carbide powders. These are mixed and distilled water added. Special precautions must be taken against dust at this stage, so visitors were asked not to smoke in the mixing rooms.

✦ ✦ ✦

THE mixed powders are filtered and dried, and then pressed into cylindrical or rectangular blanks in a 400 ton press. The compacted billets are charged into presintering furnaces, which have a hydrogen atmosphere. Then they are cut into shapes in the shaping room.

✦ ✦ ✦

THE shaped pieces go into the hydrogen atmosphere sintering furnaces, in which they are given final hardness at high temperatures. Between pressing and final hardening, a shrinkage of about 20% occurs, for which allowances must be made.

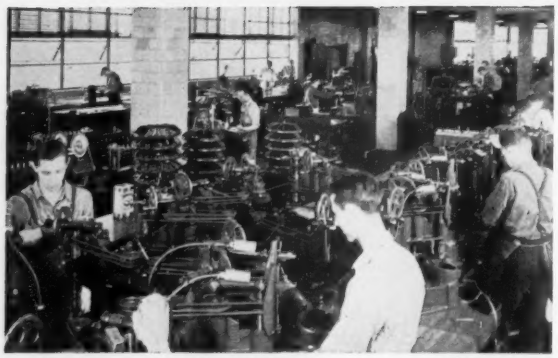
✦ ✦ ✦

THE visitors then moved on to the brazing room, where they saw tungsten carbide tips brazed to tool shanks with copper. Here also carbide nibs are cased for wire drawing dies. The last room inspected was the tool and die shop, where guests saw the finished carbides made into dies and wear-resisting parts for blanking and forming.

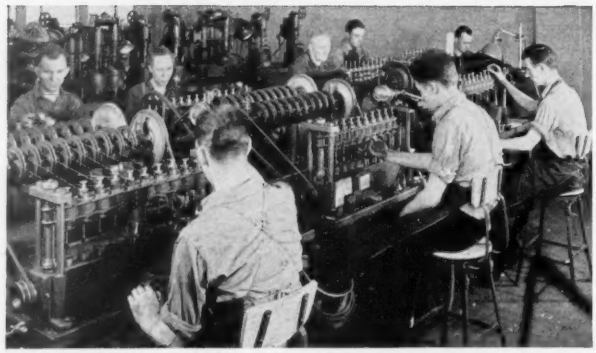
✦ ✦ ✦

AFTERWARDS, the visitors were shown motion pictures

Designated as Official Publication by the Wire Association



Battery of high speed—heavy duty drilling machines used for roughing out holes in Firthaloy dies. ✦ ✦ ✦ ✦ ✦



Battery of drilling machines in which ordinary sewing machine steel needles are used to drill small dies. These needles are often used in drilling holes about the diameter of human hair. ✦ ✦ ✦ ✦

reviewing operations in making Firthaloy dies and showing their application in machines for making eyelets from a strip. A nail mill completely equipped with Firthaloy nail dies was pictured, and slow motion pictures showed how cold heading is performed.

✦ ✦ ✦

WIRE Association members were again guests of Firth-Sterling at a dinner in the William Penn Hotel. **A. R. Zapp,** Manager of the Firthaloy Division, acted as toastmaster. Firth-Sterling President **L. Gerald Firth** welcomed his guests with a few well-chosen words.

✦ ✦ ✦

THE theme of the dinner session was national defense. Association President **J. K. Beeson,** of the Pittsburgh Steel Company, sounded the keynote by reading the following telegram from **Louis Johnson,** Assistant Secretary of War, who thanked the Association for its past cooperation and asked for continued support of industrial mobilization plans.

Pittsburgh, Pa.
May 16, 1940

The Wire Association
Major Richard E. Brown,
Executive Secretary
William Penn Hotel
Pittsburgh, Pa.

Greetings and best wishes to the Wire Association. Your loyalty and continued support is much appreciated and with your continued cooperation we can attain adequate national defense.

Louis Johnson,
Asst. Secretary of War.

✦ ✦ ✦

EXECUTIVE Secretary **Richard E. Brown,** a Major in the Signal Corps Reserve, then read a message from Major General **J. O. Mauborgne,** Chief Signal Officer of the Army, who also expressed thanks to the Association members for their cooperation with the Signal Corps. He stated that educational orders had proved valuable by advancing production schedules from four to twelve months and expressed the hope that the Signal Corps would have the opportunity during the ensuing year to place educational orders for additional critical items.

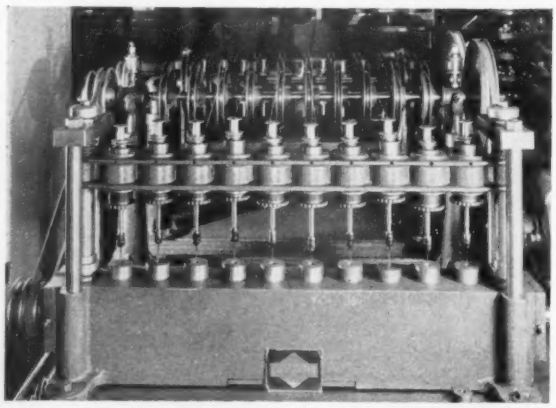
✦ ✦ ✦

WHEN presenting the message from General Mauborgne, Major Brown said:

Mr. Chairman and Members of the Wire Association:

IT gives me great pleasure to present to you a short message from **Major General J. O. Mauborgne, Chief Signal Officer of the Army,** whom most of you heard speak last year at the Wire Association's annual luncheon. I quote General Mauborgne's message:

"My congratulations are offered to your association on the occasion of this regional meeting. May I express at this time my appreciation for the fine co-operative spirit shown by your many members having relations with the Signal Corps during the past few months. I feel assured that we of the Signal Corps may, in the future, rely upon your association for even a greater degree of help no matter what de-



Battery of 6—10 head drillers. Ordinary steel sewing needles, with diamond dust and olive oil, drill holes smaller than human hair. (Hole at back of die nib can be pierced as small as 0.002 thousandths of an inch. ✦ ✦ ✦ ✦ ✦ ✦

mands may be made upon the productive capacity of the wire industries. Experience of the past few months has demonstrated the increasingly important functions which industry is called upon to fulfill to meet the changing conditions of modern warfare. Industry must know its job beforehand and be prepared to carry out these functions if necessity arises without the loss of time, which is the essence of success. To assist industry to this end the War Department has adopted the policy of placing "educational orders". It is my belief that these orders have gone far toward eliminating many of the difficulties which are connected with the quantity procurement of non-commercial items.

✦ ✦ ✦

"The training of industrial plants for munitions production, the second important element of industrial preparedness, is carried under two headings. The first is the educational orders program. The second is included under the title, 'Production Studies,' and involves the purchase of production plans from private industrial concerns which are scheduled for the manufacture of problem munitions in an emergency. It may be stated that some 1,200 of these problem items or processes are found on the War Department list of requirements. For the more important of these, educational orders are placed as far as funds permit, and there is obtained not only a small actual production of the item but a complete plan for its quantity production in war and at least a sample of the special jigs, gages, and other equipment needed for its manufacture.

✦ ✦ ✦

"Experience with War Department educational orders in the past year is that production schedules can be advanced from four to twelve months by their use.

✦ ✦ ✦

"The available educational orders funds, have so far been sufficient to cover only a few of our most important problem items; hence, it is hoped that during the ensuing year the signal corps will be afforded the opportunity to place educational orders for additional critical items of signal corps equipment with industry."

✦ ✦ ✦

THE dinner session closed with a talk by **F. A. Westphal** of the Sheffield Steel Corporation, Kansas City, Past President of the Wire Association. He stressed the need for immediate action toward preparedness and suggested that the United States build all types of armaments, prepare men and officers with suitable training and supplies, and establish a true patriotic spirit.

✦ ✦ ✦

AFTER a brief recess, the formal meeting was held, with three interesting technical papers presented and discussed. **H. L. Hopkins,** Metallurgist of the National Screw & Manufacturing Company, Cleveland, discussed "Cold Heading Bolts and Rivets." **R. M. Hussey,** Superintendent of the Wire Department, Jones & Laughlin Steel Corporation, Aliquippa, Pa., spoke on "Cleaning." **L. H. Winkler,** Metallurgical Engineer of the Bethlehem Steel Company, Bethlehem, Pa., spoke on "Galvanizing."

✦ ✦ ✦

The Technical Session

THE technical part of the meeting, arranged by **Mr. Zapp,** was intended as a trial balloon to determine the reaction of the members to the "bull session" type of meeting which, it will be remembered, seemed so successful and enjoyable in 1932 and 1933. Three members presented "papers" which were, in the main, rather brief statements of the fundamentals of three wire mill problems, and invited questions. Questions were answered more frequently from the floor than from the platform. Questions and answers were entirely off the record, and will remain so in this account; the affair was entirely free from constraint and the spirit of 1932 was recaptured to a gratifying degree.

✦ ✦ ✦

LOUIS WINKLER introduced the subject of galvanizing in a rambling discourse in his usual happy vein, and managed to keep it completely free from propaganda. Discussion concerned itself chiefly with the matter of securing a clean wire. It clearly would have opened up and gone further afield had not the chairman, with one eye on the clock, nudged the proceedings along.

✦ ✦ ✦

ROLAND HUSSEY, after a few introductory remarks, introduced the subject of cleaning by reading a prepared summary of standard practices preparatory to drawing wire. Discussion was lively, especially since **Mr. Hussey** had been rather specific. Two controversies were noteworthy, not because they settled anything, but just because they indicated where differences of opinion lay deep. One was over the opposing practices of using separate tubs and different degrees of acidity and temperature for low, medium, and high carbon steel and the practice of cleaning all grades together in a single long tub with a compromise bath. The single-tub man was not defending his practice, but rather inquiring whether in the general opinion of the members he was losing something.

✦ ✦ ✦

THE high point of the evening came during a discussion of the sull coat, and specifically over a comment on the fact that since the introduction of carbide dies the sull coat seemed to be held in lower esteem, as an element contributing to abrasion. A member expressed the view that sull had always been a mild abrasive, even in the days of cast iron dies. He pointed out that the cast iron die was good for one bundle per hole, and efforts to stretch it to two bundles were seldom made, while carbides were rated pretty accurately. He put forward the thought that a heavy sull, although somewhat abrasive, was less so than residual spots of scale on a poorly cleaned rod, and that a sull coat helped the lubricant to "butter over" scaly spots, and was, in effect, a partial antidote to the sloppy cleaning practices which flourished in the days before inhibitors and temperature control made the pickle house a fit place for human beings to work.

✦ ✦ ✦

AN old-timer present resented the implication that poor cleaning and general lack of intelligence were characteristic of earlier days. He rose to the defense of old timers in general, and his remarks, ranging over a considerable field of topics, were pungent, humorous, and thoroughly enjoyed by the members.

✦ ✦ ✦

H. L. HOPKIN'S remarks on cold heading, aimed to be a plea for closer cooperation between the cold headers and the steel makers, were taken by the latter as a challenge and a battle royal ensued, during whose course it was often hard to tell friend from foe, or to determine whether a speaker

(*Please turn to Page 305*)

America Must Be Ready

By F. A. Westphal,
Past President, The Wire Association

An address delivered before The Wire Association Regional Meeting at Pittsburgh, Pa., May 17, 1940. ✦ ✦ ✦ ✦

It is interesting to note that this address was prepared before the government officially advocated industrial preparedness.

TODAY, and at this very moment, this United States of America and we Americans are facing the immediate future with great apprehension for our individual security, freedom and liberty, such as we and our forebears established in our great country. It took no prophet to visualize our impending crisis, and allow me to review what I have previously set forth in my messages to you during the past two years, and that have been subsequently published in the historical proceedings of the Wire Association. Herewith is my first quotation:

✦ ✦ ✦

"Without working on one's emotions or being an alarmist, but instead, facing the facts with cool deliberation, it is believed that we should take full cognizance of a possible national war-time emergency due to the potential international crises facing the peoples of the democratic nations against the totalitarian nations."

✦ ✦ ✦

THE Wire Association has an intensely patriotic viewpoint, as exemplified in our Detroit convention of October, 1938 when we listened to the spirited message of the Honorable Louis A. Johnson, Assistant Secretary of War. We became particularly sensitive of preparedness in relation to industrial mobilization in war-time, or the so-called "M" Day—Mobilization Day for our armed forces, as well as industry."

✦ ✦ ✦

THERE were three potent points that I suggested as a program, and I wish to re-emphasize whole heartedly these three points. Herewith is my second quotation:

(1) For the cause of National Defense in the event of war and for the benefit of industry, it is believed that interwoven in the whole set-up of preparedness and war-time emergency adequate provisions and regulations should be made to prevent labor strikes, sit-down strikes, pillaging and sabotage incident to labor difficulties. Totalitarian nations call it treason to retard or block industrial production, therefore democratic nations should likewise adopt the same attitude.

✦ ✦ ✦

(2) The procurement of munitions for the Army and Navy should be under the jurisdiction and authority of one unified department for contracts and purchases. Today the Army and Navy purchase independently of one another, therefore, it is believed that for the cause of National Defense and to attain equalization of contracts, in a war-time emergency it would be under more efficient control to have uniformity of procedure and allocation come from one and the same authority.

FREDERICK A. WESTPHAL
Superintendent of Wire Mills,
Sheffeld Steel Corp., Kansas City, Mo.
Past President, The Wire Association

Born Holyoke, Mass., 1895. Educated U. S. Naval Academy. Four years with American Steel & Wire Co. In 1922 Assistant Superintendent Rod and Wire Works, Jones & Laughlin Steel Corp., Aliquippa, Pa. In 1928 Superintendent of Wire Mills, Sheffield Steel Corp., Kansas City, Mo. During World War served as Officer Sixth Field Artillery — severely wounded in action — twice cited and decorated for gallantry in action and meritorious services.

✦ ✦ ✦

(3) At this time our nation is vulnerable and subject to espionage from other nations. Apparently the United States is looked upon as "easy picking", and that is really a fact because we have no set-up or laws with teeth in them to protect our projects and plans for National Defense. There should be an enlargement of the intelligence sections of the Army and Navy, and a suitable legislative program should be adopted to protect, give fair and swift trials and suitable severe penalties for offenses, directly or indirectly, against our government or the cause of National Defense.

✦ ✦ ✦

Manufacturers, and industry as a whole, at this time should become sensitive to just what industrial mobilization and preparedness means. The chances may be that in the next war our enemy might strike quickly and not give us time to build and prepare as in the first World War of over twenty years ago, therefore, whatever cooperation industry can give in organizing and obtaining coordination in supplying munitions for THAT TIME of conflict, it shall be of utmost importance to our nation. We should be on the alert, encourage and cooperate to attain quick industrial mobilization for the protection of our homes, country and the cause of National Defense."

✦ ✦ ✦

ONE year ago at our Third Regional Pittsburgh meeting in this very hotel I said as follows:

✦ ✦ ✦

"In furtherance of this patriotic subject, may I express the hope that our government will be wise and understanding and take a balanced perspective, and not allow us to be led blindly or dumbly into war without an absolute just cause. As one who experienced and witnessed the horrors of war, may I say that war is truly horrible, and with no nation apparently the winner. I do say, however, for the protection of our homes, country and trade channels that we must be cognizant of industrial mobilization in time of war, and that

we should back up this administration or any future administration, on a complete and effective program of Military and Naval preparedness."

✦ ✦ ✦

IN my final Presidential message to you in Chicago in October, 1939 I stated as follows:

✦ ✦ ✦

"Twenty-two years ago we sent the American Expeditionary Forces to Europe, as well as a small force to Asia. This resulted in a casualty list of 350,000 killed, missing and wounded. Our Allies hired our money, the repayment of which seems remote. It is the absolute truth that the impetus of force in the field, as well as on the seas, by the Americans in 1918 was unquestionably the deciding factor of victory for the Allies. In spite of the lack of appreciation of the sacrifices made by the United States in the World War by the Allies it should be thoroughly understood that the United States did win World War No. 1.

"More than 150 years ago the father of our country, George Washington, advised the policy of forever steering clear of European diplomatic entanglements. In 1823 President Monroe declared the policy of the Monroe Doctrine, that meant a status quo for foreign nations transgressing on the western hemisphere. Today, some say George Washington's wisdom is outmoded because of scientific advancements in communication and travel since his time; on the other hand today we declare ourselves as upholding the Monroe Doctrine. The relation in time between Washington's advocation against European entanglements and President Monroe's declaration is the same relation of time as between World War No. 1 and the present World War No. 2.

"Our sympathies are naturally with our Canadian neighbors! It is thoroughly believed, however, that this nation should remain neutral. At the same time we should build our national defenses adequately in the air and in the Army and Navy, to a point sufficient to maintain a formidable position against any nation that might challenge our Monroe Doctrine and the Constitution of the United States, as we interpret it today and as we and our forebears fought and shed our blood for."

✦ ✦ ✦

LET us analyze the situation as it affects us today! Our military defenses are totally and fearfully inadequate and relatively in the sling-shot stage. Industrial mobilization has been a cry with us for years—and for what? Chamberlain of Great Britain after Munich in 1938 immediately started an effective preparedness program and appropriated billions for that cause; our administration in that comparable time has let our billions be squandered on W. P. A. and practically no progress on preparedness. Here are four points to consider, with the element of **time** most paramount:—

✦ ✦ ✦

(1) Build—and build our small arms, artillery, tanks, anti-aircraft and the best combat planes and bombers in existence with plenty of ammunition both for the Army and Navy.

(2) Prepare — and prepare enough men with suitable training and enough supplies of food and clothing to make them an effective and wise combat officer and soldier and sailor—marines included.

(3) Be on the alert, however, for un-American activities, as we want no "fifth column" of totalitarianism on this whole continent; neither do we want "authoritarism" as some in this country would like to call it.

(4) Let us establish a true patriotic spirit throughout the nation, and frankly a deeply religious and spiritual viewpoint. We must guard against wild propaganda that fooled us so badly in the first World War, and we must discriminate between the real and unreal. Reports will be fantastic, falsehoods, half-truths and the genuine story. The German and Teutonic blood of nearly thirty million Americans is again apprehensive and wondering, but this nation must realize that in the upbuilding of this great country those people created, built, sacrificed and shed their blood for generations in the past for this country. Again this very American blood is ready to fight for anything the Stars and Stripes stand for.

✦ ✦ ✦

IN my conclusion, gentlemen, let us pause and think a moment. Most of us are completely absorbed and taken up in our work to give politics and preparedness much of our concentrated attention. We must about face on this attitude and be ready for sacrifices to gain the best leadership of our governmental affairs today, and in turn to secure the fastest and soundest program of military preparation to protect our country.

✦ ✦ ✦

AT this very minute we find the strategy and tactics of the democratic nations are completely outmoded and are really but a feeble resistance against the invader. Day by day events are most trying and they will continue so, and may we face the future with courageous confidence. My final wish and salute to you all is: "GOD BLESS AMERICA."

New Members of The Wire Association
May 1 to May 30, 1940

BUTLER, R. CLYDE, Gen. Works Mgr.,
Pittsburgh Steel Company,
Monessen, Pa.

CATE, L. CHESTER, Wire Mill Foreman,
Republic Steel Corp.,
Gadsden, Ala.

FOGARTY, THOS. S., Supt.,
Cobb & Drew, Inc.,
Plymouth, Mass.

GLASER, E. S., Supt.,
National Drawn Steel Co., Inc.,
East Liverpool, Ohio.

HALL, EDW. P., Metallurgist,
Kennecott Wire & Cable Co.,
Phillipsdale, R. I.

HAYTHORNE, KEMP, Sales Manager,
Acorn Insulated Wire Co.,
Brooklyn, New York.

KELLOGG, C. A., Chief Metallurgist,
Continental Steel Corp.,
Kokomo, Indiana.

LARSON, H. E., Application Engr.,
General Electric Company,
Schenectady, New York.

LEPAGE, L. J. C., Director,
Sambre-Escaut, S. A.,
1, Avenue Des Ormes,
Nouveau-Pare-Antwerp, Belgium.

MAY, A. A., Plant Supt.,
Driscoll Wire Company,
Shelton, Conn.

MORDICA, JOHN W., Salesman,
Firth-Sterling Steel Co.,
McKeesport, Pa.

PALMER, W. J., Works Manager,
Phelps Dodge Copper Products Co.,
Bayway, New Jersey.

PEIRCE, E. H., Supt. Rod & Wire Dept.,
Wheeling Steel Corp.,
Portsmouth, Ohio.

SCHMIDT, R. H., Supt. Wire Mill,
Plant No. 2,
Eaton Manufacturing Co.,
Massillon, Ohio.

SHUBROOKS, G. E., Chief Chemist,
Hamilton Watch Company,
Lancaster, Pa.

SKEKEL, ALEX, Supt., Wire & Wire Products,
Pittsburgh Steel Company,
Pittsburgh, Pa.

SULLIVAN, J. J., Wire Research,
Universal-Cyclops Steel Co.,
Bridgeville, Pa.

VIRDEN, C. L., Supt.,
Reid Avery Company,
Dundalk, Balt., Maryland.

✦ ✦ ✦

Regional Meeting

(Continued from Page 303)

was assuming, for the moment, the role of steel maker, or of a producer of cold heading wire. There seemed to be general agreement that (1) the cold header was sometimes over-meticulous in his requirements, (2) the steel maker could do more if he would (there were not many steel-makers present) and (3) the wire mill was in the middle, and had to make lousy steel into super-bolts. This was the warmest discussion of the session, and there seemed to be hardly a member who was without an opinion and a grievance.

✦ ✦ ✦

ALTOGETHER the session was enjoyable and fruitful, even though discussion had to be cut off before it really reached the heart of the subject. Comments were heard to the effect that the program committee should give serious thought to the bull session as a Cleveland attraction next October.

Attendance List — Pittsburgh Regional Meeting — May 17, 1940 —

ABSON, G. W., Claim Supervisor,
Jones & Laughlin Steel Corp.,
Aliquippa, Pa.

AIKEN, J. C., Asst. Supt., Rod & Wire,
Jones & Laughlin Steel Corp.,
Aliquippa, Pa.

ALBRIGHT, ALVIN T., Wire Mill
Metallurgical,
Jones & Laughlin Steel Corp.,
Aliquippa, Pa.

ALDRICH, W. O., Asst. Dist. Ind. Engr.,
American Steel & Wire Company,
Pittsburgh, Pa.

ARENSBURG, CHAS. C., Secretary,
Pittsburgh Tag Company,
Pittsburgh, Pa.

ATKINSON, W., Wire Mill Foreman,
Jones & Laughlin Steel Corp.,
Aliquippa, Pa.

BALTZ, H. HUGHES, Pur. Agt.,
Wyckoff Drawn Steel Co.,
Ambridge, Pa.

BANTZ, M. T., Asst. Pur. Agt.,
Eaton Mfg. Co., Reliance Div.,
Massillon, Ohio.

BAWDEN, WILLIAM D., General Supt.,
Reynolds Wire Company,
Dixon, Illinois.

BEARDSLEE, K. R., General Sales Mgr.,
Carboloy Company, Inc.,
Detroit, Michigan.

BEESON, J. K., Asst. Gen. Mgr. Sales,
Pittsburgh Steel Company,
Pittsburgh, Pa.

BEIGHLEY, A. E., Sales Repr.,
American Chemical Paint Co.,
Ambler, Pa.

BIHLMAN, VICTOR W., Research Metallurgist,
Wheeling Steel Corporation,
Wheeling, W. Va.

BOSWIN, GEORGE A., Sales Mgr.,
Stevens Metal Products Co.,
Niles, Ohio.

BOYD, WM. W., Chief Inspector,
Oliver Iron & Steel Corp.,
Pittsburgh, Pa.

BOYNE, C. B., Sales Mgr., Stainless Steel,
Allegheny-Ludlum Steel Corp.,
Pittsburgh, Pa.

BRALEY, S. A., Ch. Metallurgical Field Engr.,
Pittsburgh Steel Company,
Pittsburgh, Pa.

BRANDENBERG, J. A., Sales Engr.,
American Manganese Steel Div. of
American Brake Shoe & Fdry. Company,
Pittsburgh, Pa.

BRODEN, E. H., Mgr. of Operations,
American Steel & Wire Co.,
Pittsburgh, Pa.

BROWN, RICHARD E., Publisher,
WIRE & WIRE PRODUCTS,
Stamford, Conn.

CARR, E. R., Metallurgist,
Oliver Iron & Steel Co.,
Pittsburgh, Pa.

CHAPMAN, FRED, Chief Clerk,
Firthite Division,
Firth-Sterling Steel Co.,
McKeesport, Pa.

CHISHOLM, MARQUIS, Sales Manager,
Edward W. Voss,
Dormont, Pittsburgh, Pa.

CLARK, H. B., Sales Manager,
Vascoloy-Ramet Corporation,
North Chicago, Illinois.

CLEMENTS, W. C., Asst. Met. Engr.,
Bethlehem Steel Company,
Bethlehem, Pa.

COOCH, L. S., Metallurgist,
Buffalo Bolt Company,
North Tonawanda, N. Y.

COWLES, H. E., Ch. Engr.,
Lee Wilson Engineering Co.,
Cleveland, Ohio.

CRAMER, R. E., Dist. Engineer,
American Steel & Wire Co.,
Pittsburgh, Pa.

CREWE, L. C., Asst. Supt. Rod & Wire Mill,
Bethlehem Steel Company,
Sparrows Point, Md.

CURTIN, D. J., Asst. Metallurgist,
Youngstown Sheet & Tube Co.,
Youngstown, Ohio.

DIMLING, PAUL E., Salesman,
Firth-Sterling Steel Co.,
Cleveland, Ohio.

DREVER, HORACE, President,
The Drever Company,
Philadelphia, Pa.

DUNKLEBERGER, L. E., Chief Engr.,
Reynolds Wire Company,
Dixon, Illinois.

DUTHALEE, EDWARD R., Foreman,
Wire Mill Die Room,
Jones & Laughlin Steel Corp.,
Aliquippa, Pa.

ELIAS, HENRY W., Asst. Mgr.,
Firthaloy Division,
Firth-Sterling Steel Co.,
McKeesport, Pa.

EMM, FRED, Supt. Wire Mill,
Rustless Iron & Steel Corp.,
Baltimore, Maryland.

ERDMAN, H. C., Chief Engineer,
National Screw & Mfg. Company,
Cleveland, Ohio.

FANTONE, CHAS. B., President,
Syncro Machine Company,
New York, N. Y.

FINDLEY, J. K., Sales Metallurgist,
Allegheny-Ludlum Steel Corp.,
Dunkirk, New York.

FISHER, E. J. P., Metallurgist Engr.,
R. F. D. #1,
North Jackson, Ohio.

FOSS, FEODORE F., Director Research & Met.,
Wheeling Steel Corporation,
Wheeling, West Virginia.

FREW, CLYDE H., Supt. Rod Shed &
Pickling Rooms,
Townsend Company,
Fallston, Pa.

FROMMANN, W. H., General Supt.,
Townsend Company,
New Brighton, Pa.

GALLAGHER, EDW., Supt.,
Pittsburgh Tool Steel Wire Co.,
Monaca, Pa.

GARRATT, F. E., Cold Finishing Dept.,
Universal-Cyclops Steel Corp.,
Bridgeville, Pa.

GARRETT, CARLETON W., Ch. Inspector,
Rod & Wire,
Jones & Laughlin Steel Corp.,
Aliquippa, Pa.

GLASER, E. S., Supt.,
National Drawn Steel Co., Inc.,
East Liverpool, Ohio.

GLEN, A. E., Salesman,
Carboloy Company, Inc.,
Pittsburgh, Pa.

GLUNT, JAMES A., Inspector,
Jones & Laughlin Steel Corp.,
Aliquippa, Pa.

GRAHAM, W. A., Metallurgical Engr.,
Westinghouse Electric & Mfg. Co.,
Pittsburgh, Pa.

GRIFFITH, ROBERT, Secretary,
Pittsburgh Tool Steel Wire Co.,
Monaca, Pa.

HAARBAUER, H. W., Supt. Wire Mill,
Townsend Company,
New Brighton, Pa.

HAARBAUER, W. E., Asst. Supt. Wire Mill,
Townsend Company,
New Brighton, Pa.

HADDOCK, J. M., Buyer,
American Steel & Wire Co.,
Cleveland, Ohio.

HADSELL, D. W., Gen. Foreman,
Rod & Wire & Conduit Dept.,
Youngstown Sheet & Tube Co.,
Struthers, Ohio.

HAGUE, JOSEPH R., Salesman,
The Ironsides Company,
Columbus, Ohio.

HANNON, C. H., Metallurgist,
General Electric Company,
Pittsfield, Mass.

HARBARGER, W. C., Chief Engineer,
Page Steel & Wire Div.,
American Chain & Cable Company,
Monessen, Pa.

HARRIS, JAMES C., JR., Engineer,
The Drever Company,
Philadelphia, Pa.

HARTFORD, ROBERT L., Pittsburgh Editor,
Penton Publishing Company,
Pittsburgh, Pa.

HIGHLEY, E., Supt. Wire Mill,
Allegheny-Ludlum Steel Co.,
Dunkirk, New York.

HISSRICH, LAWRENCE P., Clerk,
Jones & Laughlin Steel Corp.,
Aliquippa, Pa.

HOLMQUIST, C. W., Works Manager,
Copperweld Steel Company,
Glassport, Pa.

HOPKINS, H. L., Metallurgist,
National Screw & Mfg. Co.,
Cleveland, Ohio.

HULME, G. E., Asst. Supt.,
Heat Treating & Cold Drawing,
Pittsburgh Crucible Steel Co.,
Midland, Pa.

HURWITZ, LEON A., Wire Investigator,
Jones & Laughlin Steel Corp.,
Aliquippa, Pa.

HUSSEY, R. M., Supt. Wire Dept.,
Jones & Laughlin Steel Corp.,
Aliquippa, Pa.

JACKMAN, ALAN, Firthaloy Div.,
Firth-Sterling Steel Company,
Chicago, Illinois.

JOHN, ARTHUR,
M. K. Mellott & Company,
Pittsburgh, Pa.

JONES, EDWARD, Machine Shop Foreman,
American Steel & Wire Co.,
Braddock, Pa.

JONES, J. F., Master Mechanic,
American Steel & Wire Co.,
Braddock, Pa.

JONES, JOHN L., Industrial Engr.,
Pittsburgh Steel Co.,
Monessen, Pa.

JUDKINS, MALCOLM F., Ch. Engr.,
Firthite Division,
Firth-Sterling Steel Company,
McKeesport, Pa.

JUNKIN, JOHN M., Salesman,
Warner Company,
Pittsburgh, Pa.

KAHL, ROBERT J., Asst. Supt. Wire Mill,
Pittsburgh Steel Co.,
Monessen, Pa.

KAVANAGH, M. R., General Mgr.,
Oliver Iron & Steel Corp.,
Pittsburgh, Pa.

KELLER, E. C., Sales Engr.,
Lee Wilson Engineering Co.,
Cleveland, Ohio.

KELLOGG, C. A., Chief Metallurgist,
Continental Steel Corp.,
Kokomo, Indiana.

KELLY, J. HAROLD, Sales Agt. Mfg. Products,
Pittsburgh Steel Co.,
Pittsburgh, Pa.

KEPPLE, JOHN, Foreman,
Pittsburgh Screw & Bolt Corp.,
Pittsburgh, Pa.

KLEIN, H. C.,
The B. F. Goodrich Co.,
Akron, Ohio.

KREISBERG, SOL, Wire Investigator,
Jones & Laughlin Steel Corp.,
Aliquippa, Pa.

KUMER, J. R., JR., Mgr. Sales Wire & Bars,
Allegheny-Ludlum Steel Corp.,
Pittsburgh, Pa.

LABEKA, C. L., Metallurgist,
Pittsburgh Steel Company,
Monessen, Pa.

LEWIS, K. B., Consulting Engr.,
Worcester, Mass.

LOACH, WILLIAM J., Powder Metallurgist,
Firth-Sterling Steel Co.,
McKeesport, Pa.

LOGGIE, J. G., General Foreman,
Westinghouse Electric & Mfg. Co.,
Pittsburgh, Pa.

LONGKNECKER, HARRY F., Sales Repr.,
Firth-Sterling Steel Co.,
McKeesport, Pa.

LONGWELL, JAMES R., Chief Engineer,
Carboloy Company, Inc.,
Detroit, Michigan.

LUCAS, R. J., Foreman—Dies,
American Steel & Wire Company,
Cleveland, Ohio.

MARLOWE, C., Sales & Engr.,
A. W. Cadman Mfg. Co.,
Pittsburgh, Pa.

MARSHALL, PAUL E., Sales—Reel Dept.,
The Stevens Metal Products Co.,
Niles, Ohio.

MARTIN, F. L., Salesman,
Warner Company,
Pittsburgh, Pa.

MARTIN, QUINTON T., Industrial Engr.,
American Steel & Wire Co.,
Pittsburgh, Pa.

MORDICA, JOHN W., Salesman,
Firth-Sterling Steel Co.,
Brentwood, Pa.

MORITZ, JOHN A., Supt. Wire Mills,
Keystone Steel & Wire Co.,
Peoria, Illinois.

MORITZ, JOHN O., Salesman,
Firth-Sterling Steel Co.,
McKeesport, Pa.

MORRIS, G. L., Sales Engr.,
Syncro Machine Company,
New York, N. Y.

MORRISON, W. M., President,
Morrison Engineering Corp.,
Cleveland, Ohio.

MOSLO, ERNEST P., President,
Moslo Machinery Inc.,
Cleveland, Ohio.

MOYER, R. F., Vice President,
Standard Machinery Company,
Providence, Rhode Island.

MUNFORD, WALTER F., Asst. Mgr.,
American Steel & Wire Company,
Pittsburgh, Pa.

McCARTHY, B. L., Chief Metallurgist,
Wickwire Spencer Steel Co.,
Buffalo, New York.

McCOY, A. W., JR., Salesman,
Firth-Sterling Steel Co.,
New York, N. Y.

McGOWAN, C. L., Supt. Wire Mills,
Atlantic Steel Company,
Atlanta, Georgia.

McILVRIED, E. J., V. P. & Ch. Engr.,
Vaughn Machinery Company,
Cuyahoga Falls, Ohio.

(Please turn to Page 323)

KEEP POLITICS OUT OF INDUSTRIAL MOBILIZATION!

WE are all agreed now on the necessity for mass production of airplanes, guns, ammunition and the many critical military and naval items in which a serious shortage exists.

✦ ✦ ✦

FROM the newspaper stories and editorial comments published in many sections of the United States, due to the publicity propaganda of the New Dealers, everyone would get the impression that no plans have been made to meet such a situation and that a state of confusion exists among those responsible for industrial preparedness.

✦ ✦ ✦

WHAT these publicity writers need is a little legal education on "THE NATIONAL DEFENSE ACT OF 1916" which was amended in June, 1920 as a result of our sad industrial experience of 1914-18. This act, among other matters, provides legal authority for National Industrial Mobilization in time of emergency.

✦ ✦ ✦

UNDER this law we now have an Industrial Mobilization Plan approved by the Navy and War Departments which provides definite methods for handling just such a situation as now exists.

✦ ✦ ✦

FOR many years several hundred of the best qualified officers of the Army and Navy have been contacting industry, making surveys of plant capacities, possibilities for expansion, requirements for emergencies, etc., as a result of which definite policies have been formulated and plans completed, which if put in operation as contemplated, would eliminate much of this near-hysteria and resultant confusion, and demonstrate that the military services know their business.

✦ ✦ ✦

OF course, this plan eliminates the politician, and leaves the job in the hands of the men trained to do it. It also tends to debunk any "new-deal" political ballyhoo, as the credit, if any, could only go to the men who for years have foreseen this contingency and prepared to meet it.

✦ ✦ ✦

WHY not put this plan, which is based on past experiences and on existing law in operation? It includes civilian co-ordinating and control boards operating in complete cooperation with the purchasing divisions of the Army and Navy. The organization is basically sound and complete enough now to go to work.

✦ ✦ ✦

THE Assistant Secretary of War, Louis H. Johnson, who has up to this time so ably devoted his every energy to the project and has demonstrated his foresight and ability to a marked degree in Industrial Planning, should be the man to govern our Industrial Mobilization; not some fair-haired pet of the administration who needs publicity and votes.

✦ ✦ ✦

KEEP the job in the hands of the men who know how to do it—assisted by the various procurement divisions of the Army and Navy,

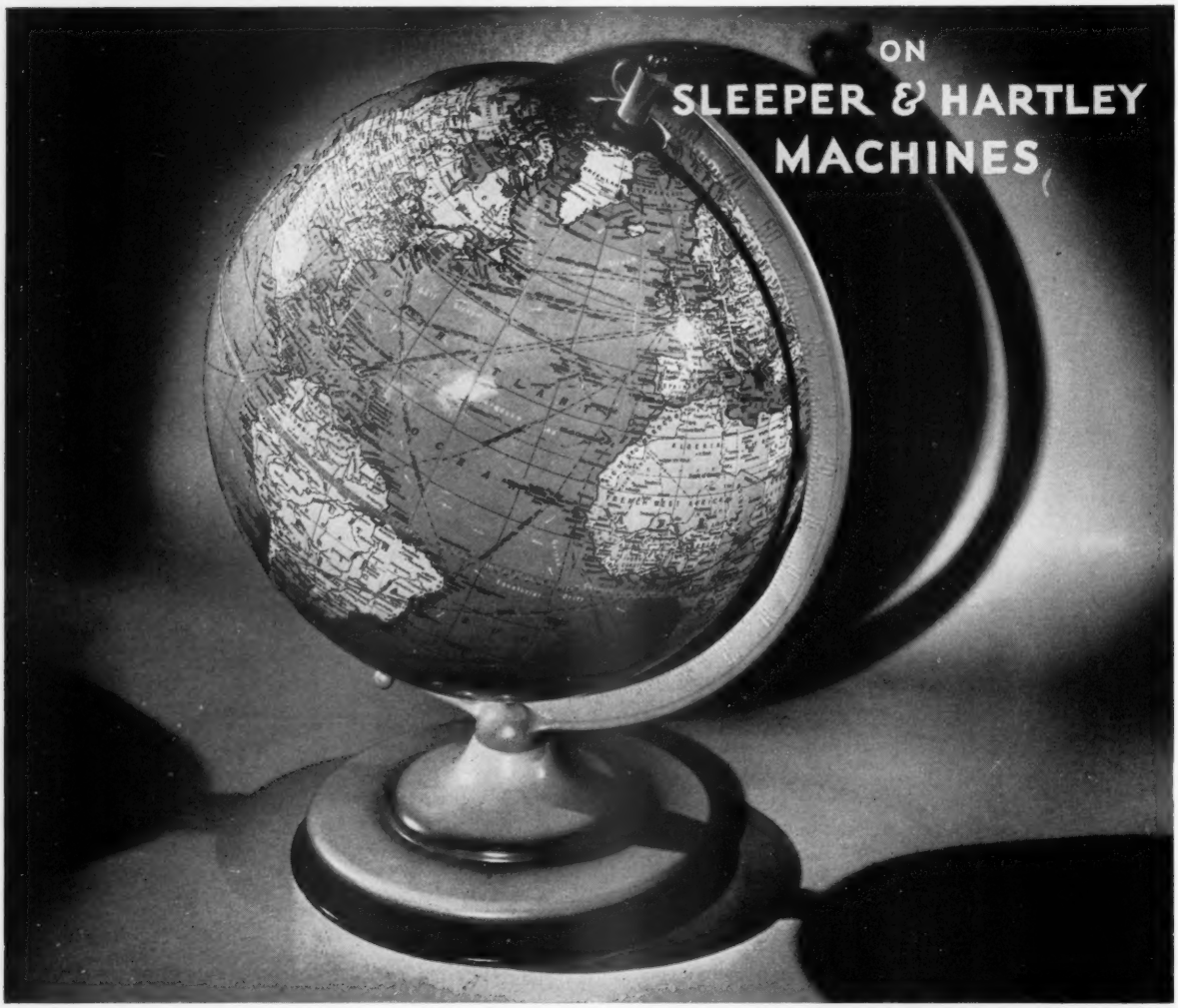
and they do know how.

Richard E. Brown

PUBLISHER

"THE MACHINES THAT PUT THE 'RINGS' IN SPRINGS"

THE SUN NEVER SETS



S. & H. Machines
have been sold in the following countries:

Argentine	Holland
Australia	India
Belgium	Italy
Brazil	Japan
Canada	Mexico
China	New Zealand
Colombia	Norway
Czechoslovakia	Poland
England	Russia
France	Scotland
Germany	Spain
Greece	Sweden
Guatemala	United States

in fact—

We have built more Automatic Spring-Making Machines, during the past twenty-five years, than all other manufacturers in the WORLD.

SLEEPER & HARTLEY, INC.
DESIGNERS AND BUILDERS
WORCESTER, MASSACHUSETTS, U. S. A.

Improvements In Wire and Rod Baking Practice

By J. M. Petix,
Engineer, J. O. Ross Engineering Corporation,
New York, N. Y.

A GREAT many of the things we use in our daily lives have been developed during the short period since the turn of the Century. To be sure, some of these were in existence before that period began, but in what to us now appear as very crude forms. New materials and methods have played an important part in these developments, and to a certain extent Wire Mills have, like other plants, followed along in this progress.

✦ ✦ ✦

WITH these technical developments achieved, Steel Mills are today able to control essential factors in manufacture, and are thus able to furnish the Wire and Rod Mills with steels that are best suited for the processing required and for the duty which the final product is to perform. Unless, however, the Wire Mills help to carry forward this chain of control during the various steps leading to the final stage, efficiency of operation, or quality of product, or both, may be impaired. This is especially true of wire and rod baking and for this reason more and more attention is being given to this department of the Wire Mills.

✦ ✦ ✦

IT is surprising to find how many plants, both large and small, in spite of available improved methods of baking, are still using antiquated equipment for this very necessary step in the production of both high and low carbon wire and rods, and while in days long gone by it may have been satisfactory to bake by those methods, there would seem to be no real reason for continuing their use at the present day.

✦ ✦ ✦

THE old type of baker usually consisted of a brick enclosure housing one or more pairs of steel channel floor tracks onto which the "buggies" or trucks carrying the lime coated coils were pushed by the operators. The depth of these bakers and the number of tracks, of course, depended on the space available and on the output for which they were built. Due to the very long baking periods very often required, this meant the use of considerable floor space for these bakers, even in a Mill of average production.

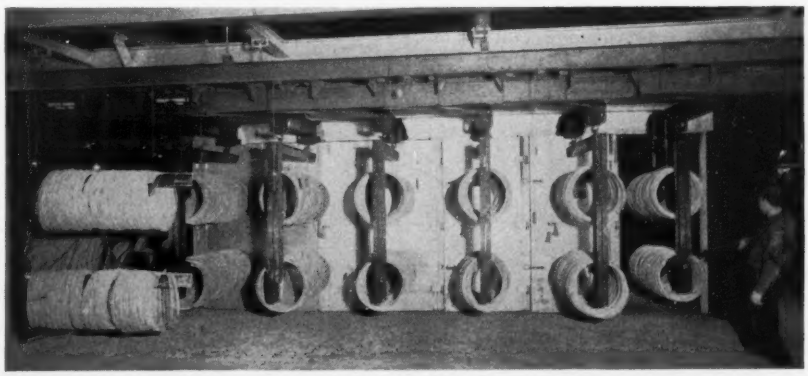


Fig. 1. Shows a recent baker installation with six lines of overhead tracks, each carrying eight "E" hooks. Note the simplicity with which the loaded hooks may be handled by the operator. ✦

ONE or both ends of the baker were provided with vertically lifting doors, or with hinged uninsulated steel plate doors equipped with heavy crude bolting means. As heating medium, heavy or light fuel oil, producer, natural, or City gas were used, and numerous installations using these fuels as well as coal are still in use. Baking temperatures were between 250°F. and 350°F.

✦ ✦ ✦

WITH knowledge gained mostly through production experience, attempts were made to prevent the products of combustion from getting into the baker proper and contacting the lime coated coils of wire and rods. Most of the old bakers in operation today were designed to prevent this contamination of product by flue gases, but while the idea was good its application was far from satisfactory.

✦ ✦ ✦

IN one of the designs the hot flue gases were carried by a steel plate duct running back and forth in a serpentine arrangement below the tracks, and since the space between each pair of tracks was open clear through to this hot flue pipe, some heat, mainly by radiation and partly by convec-

tion, traveled up to the coils. Another design of heating system had the flue gases travel in a brick trench directly below the line of trucks. The top of this trench was fitted with fairly close fitting iron castings so as to form a duct, the top of which was capable of greater heat transfer. These designs were very inefficient due to the large proportion of the heat developed by the fuel going up the smoke stack. Further, the ducts, due to expansion and contraction, eventually leaked and carbon dioxide and sulphur dioxide entered the baking enclosure. Under these conditions it was soon recognized that the elimination of the flaky lime coat, rusting of the coils and slowness of baking were problems which required early solution if improved product was to be obtained. In addition, the men at times complained of the working conditions due to the need of their going into the hot baker to unload a batch, and in some instances at least, it became necessary to install drag chain conveyors for this service. Many other mills chose to cool the baker to a relatively comfortable temperature after each bake before unloading, and thereby decreased the daily production of the baker units while increasing the fuel cost per ton of product baked.

✦ ✦ ✦

WIRE and Rod Bakers of the type described, due to lack of air circulation, permitted the air to stratify, and with this uneven temperature distribution, even baking was impossible. This would not be especially serious were it not for the fact that the baking period of the entire baker load was often determined by the last spot to dry. While from time to time there have been attempts to improve both baking conditions and methods of handling the coils, the few improvements which took place were in the latter classification, and no real effort was made to change the method of heating, in spite of the availability of heating equipment which would eliminate the possibility of introducing flue gases into the baker.

THIS history would not be complete without at least a mention of Hydrogen, which most Wire Mill authorities agree is present in wire and rods as a result of cleaning the bundles or coils by means of an acid solution. These men believe that to get rid of this element satisfactorily, a period of from one to two hours in the baker is necessary. They also state that acid brittleness caused by this Hydrogen cannot be removed by a quick bake at very high temperatures, which may instead cause pitting of the metal.

✦ ✦ ✦

THE past decade has produced marked improvements in the equipment used for baking, and as a result it is possible to obtain much shorter baking cycles, freedom from injurious flue gases, ease and comfort in loading and unloading, economical use of heat, even temperature distribution and drying, and the elimination of Hydrogen. In the type of air heated baker which will be described, the source of heat is an indirect air heater gas or oil fired, which makes it entirely impossible for products of combustion to enter the baker circulating system. A large part of the air in the baker which is kept at any point between 300°F. and 350°F., is recirculated in order to conserve heat, and only an air volume just sufficient to carry off the gases and water vapor liberated during the baking process is exhausted.

✦ ✦ ✦

THE enclosure for the baker lines is made up of insulated panels of uniform width fitted together through a tongue and groove construction. These panels, which make up the side walls and ceiling of the baker, are available in thicknesses to suit the temperature of baking, and are filled with one of the various types of insulating materials available for the purpose. The baker floor can be made up of the same type of panels laid on the floor proper, or if a poured floor is desired, this can be of insulating construction. Both ends of the baker are equipped with ruggedly constructed insulated doors, the number being determined by the number of lines in the baker. Two methods are usually used for carrying the wire and rod "bundles," the familiar trucks or buggies which ride on channels set on the baker floor, or the "E" type hangers, each of which is suspended from two four wheel ball bearing trolleys running on special "I" beam tracks. While trucks may be available from the old bakers which are being replaced, it is often desirable in the installation of a new baker of modern design to use the "E" hangers. This is recommended because of the resulting ease of handling, as well as the saving of floor space which the double decking of bundles makes possible. Pitching the tracks from the incoming end of the baker to the outgoing end, just sufficiently to overcome the slight trolley friction, enables the opertors to load and unload the baker without entering it. The inside faces of the doors at the unload end are equipped with spring bumpers to absorb any slight shock when the loaded hanger reaches that end of the baker. A return track running outside of the baker carries the emptied "E" hooks back to the cleaning room. Any lime dripping onto the floor does not in any way interfere with operation and can be easily removed after long periods of operation. There is no clogging of floor ducts, no formation of a thick insulating layer of lime or flues or plates, as in the old type bakers, and the process of baking becomes almost continuous.

✦ ✦ ✦

THE various fans required to circulate and vent the proper volumes of air as well as the heaters can usually be located on a structural steel platform built over the baker. Any other suitable location adjacent to the oven can of course be utilized, but shorter connections and compactness suggest the superimposed arrangement of oven and apparatus.

✦ ✦ ✦

THE heating units deliver a volume of heated fresh air which is mixed with a proportionately greater volume of air recirculated from the baker. The com-

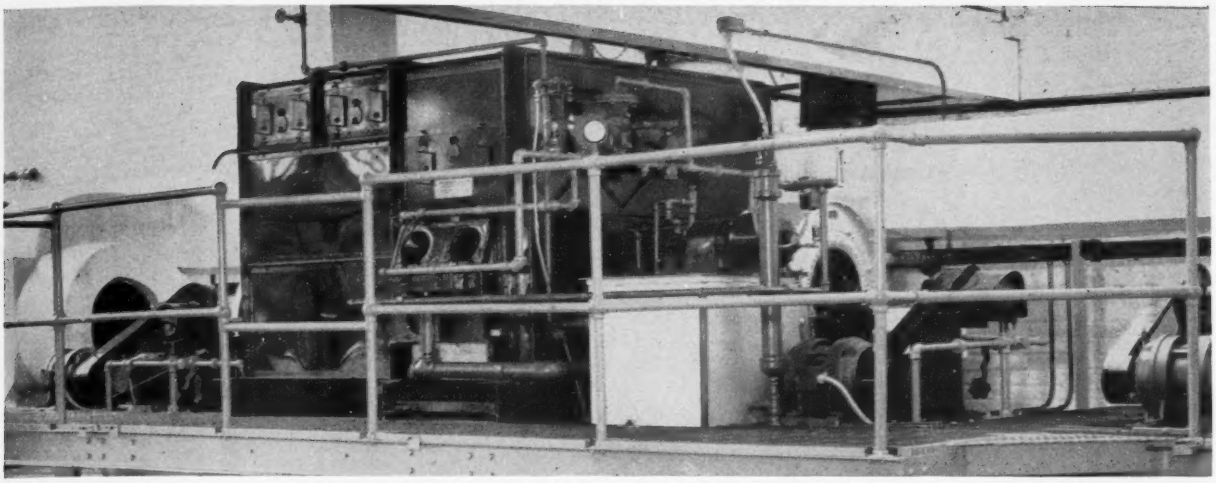
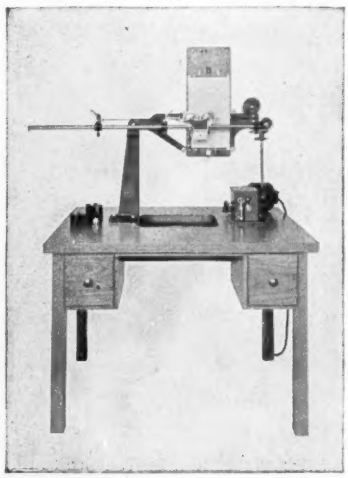


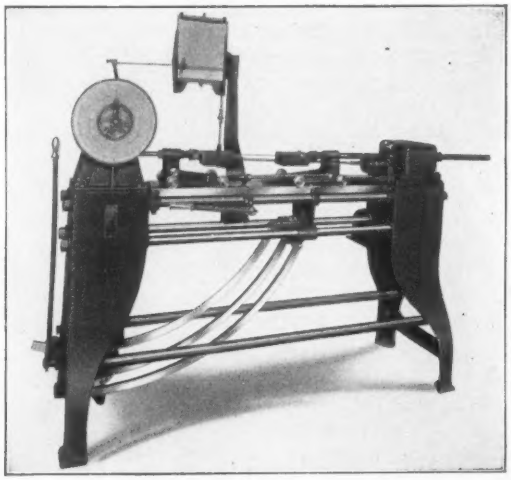
Fig. 2. An indirect oil fired air heater and the various safety and control instruments. This apparatus as well as the fans, motors and drives, are mounted on a convenient structural steel platform over the baker whenever possible. For larger heat requirements a number of these heater sections are arranged alongside each other to make a compact efficient installation.

bined volume which results is handled by a larger volume centrifugal fan and is delivered through suitable sheet metal distributors running parallel to the baker lines but set near the ceiling so as to be out of the way. Air from these supply ducts is discharged downward at sufficient velocity to reach the bottom of the coils. The lighter density of this air plus the suction at the return ducts which are alternately spaced with the supply distributors at the ceiling of the baker cause a continuous sweep of heated air around the wire or rod coils. All the fans making up the air heating and circulating system are equipped with bearing features designed to enable them to satisfactorily take care of the particular temperature to be handled, and the heaters which can be fired by means of gas or oil are provided with temperature control and safety instruments, making their operation both simple and safe. While the foregoing description covers one of the usual designs, individual plant conditions may require changes in baker proportions, or method of firing the heaters or handling the product. These can usually be made without in any way sacrificing any of the advantages outlined.

SCOTT TESTERS



Model IP-2
Maximum capacity
2 pounds



Model Q-5
Maximum capacity
2000 pounds

AUTOGRAPHIC recording tensile testing machines built on either the constant specimen rate of load or constant speed of pull principles. Made in a wide range of models and capacities with high and low stretch magnification recorders - for Wire, Sheet Metals, Rubber, Textiles, Paper, etc.

HENRY L. SCOTT CO.

P. O. BOX 963 PROVIDENCE, R. I.

The Best Fluxing Technique For Hot Dip Galvanizing

By Wallace G. Imhoff,
Technical Director of Research,
American Hot Dip Galvanizers Association,
Pittsburgh, Pa.

The basis of making a change from one practice to another must be a complete understanding of the technical phases of the old practice, as compared to the technical phases of the new practice. This complete understanding reveals the advantages to be obtained by adopting the new technique and discarding the old one. It is to be expected that the change of methods will improve the quality of the product, reduce the number of articles which are either rejected entirely or classed as seconds, cut down the waste and losses involved in by-products, improve operating conditions and improve production methods; all at lower manufacturing costs. ✦ ✦ ✦ ✦ ✦ ✦

What Is Meant By The Term "Flux"

A FLUX is a material which first changes insoluble oxides into other soluble salts or liquids, and second, which when converted into the soluble form are removed from the metal surface, leaving it perfectly clean and in suitable condition to take on or receive a perfect zinc coating.

✦ ✦ ✦

The basic principle of Hot Dip Galvanizing is that the surface of the iron base metal must be absolutely clean bare iron when the molten zinc is applied for zinc coating.

✦ ✦ ✦

THIS fundamental principle must never be lost sight of from the very beginning of the galvanizing process to the end, and during every step or operation in between. The great value of hot galvanizing is due to the strong affinity that hot molten zinc has for clean, bare iron. Highest quality, highest production, lowest wastes and lowest manufacturing costs are obtained when every operation of the galvanizing process keeps the iron surface absolutely clean until the moment it goes down into the molten zinc to receive its coating.

✦ ✦ ✦

Early Methods Permitted Corrosion To Take Place

THE sequence of earlier galvanizing practice was to first receive the articles coated with scale and perhaps rust, pickle them in sulphuric acid to remove the scales and iron oxides, dip in a muriatic acid dip, drain or dry, and then pass the articles down through a molten sal-ammoniac slag flux on top of the molten zinc bath. The early practice also permitted the removal of oil and grease on the work in the pickling bath. Fluxing consisted of the muriatic acid dip and going through the sal-ammoniac flux on the bath.

✦ ✦ ✦

Disadvantages of the Old Fluxing Practice

IT is well at this point to reveal the many disadvantages that were present when this old technique was, or is, used, since many plants still hold to the muriatic acid dip, and the sal-ammoniac flux on the bath. In the first place, total rejections and excessive seconds are always present when oil and grease are removed in the pickling tanks. The grease prevents the acid from attacking the scale, and if there is the smallest particle of scale or iron oxide left on the surface either a black spot, a flux spot or a bare and exposed steel spot will result. A second very important fact was that the chemical reactions of pickling were not fully understood, and in many cases sulphuric acid was used in attempting to remove sand from castings and fittings.

✦ ✦ ✦

IN these early periods cleaning, pickling, drying, fluxing and galvanizing were not recognized as one practice with each operation vitally affecting the ones following. Instead, the pickler was a pickler; the galvanizer, a galvanizer; and in many plants neither knew much about the other's work or the relation that one operation had to another. When trouble came, the galvanizer blamed the pickler and the pickler blamed the galvanizer. The errors and lack of technical knowledge of both caused excessive fumes in both pickling and galvanizing operations, excessive dross and by-products as a whole, and many coating troubles such as flux spots, bare spots, peeling and flaking of the coating, low adherence, and a long list of other well known galvanizer's troubles.

✦ ✦ ✦

Explanation of Technical Phases Of Old Fluxing Practice

THE old fluxing practice, as mentioned above, consisted of a dip in muriatic acid and then passing of the article down through a molten slag flux of sal-ammoniac on the galvanizing bath. As far back as 1917, questions had already been asked in regard to the various kinds and grades of sal-ammoniac that were best suited for galvanizing fluxes, and after the war some

foreign grades made their appearance in the American market and great advantages were claimed for them. As early as 1920 the writer became actively interested in the study of what actually happened in the fluxing process and what kind of material was best to use. This study involved in a very lively manner the whole question of dross formation, corrosion after pickling, corrosion on the dryer and the various sources of iron to form dross. In December 1930 in a series of four articles in The Iron Age, the question of dross was covered, and in 1935 and 1936 in the same technical trade journal three articles covering corrosion after pickling as a major source of galvanizer's dross, appeared. In the meantime this knowledge was being applied in a practical way to bring about a radical change in fluxing technique.

✦ ✦ ✦

AN explanation of the technical phases of the old fluxing practice requires the introduction of some chemistry to reveal what happens in fluxing, and also how corrosion developed after pickling and during drying; also the effect of iron salts carried over on the work into the galvanizing bath. The practical question from a chemical standpoint is that iron oxides and corrosion products (various types of iron oxides) are insoluble, and, when dried, and allowed to remain on the surface of the article, act as an insulating material preventing the molten zinc from alloying or bonding to the base metal. In work "burned" on the dryer, this corrosion film (iron oxides) actually forms a definite insulating layer between the zinc coating and the base metal and is directly responsible for very low adherence of the coating, and peeling and flaking from the base metal.

✦ ✦ ✦

SULPHURIC acid pickles tend to cause rapid oxidation of the clean surface after pickling. First there is a green "slime" of ferrous sulphate that tightly adheres over the surface. With very hot sulphuric acid pickles and quick drying, this ferrous sulphate may leave a white deposit of dehydrated ferrous sulphate over the surface. It should always be borne in mind that there are at least two distinct phases of galvanizing, namely, the preparation for galvanizing, and the actual zinc coating consisting of the immersion in the molten zinc bath. The preparation for galvanizing must not only remove all of the insoluble scales and iron oxides on the surface, but they must be kept from re-forming again due to contact with the air in drying, or other steps prior to the actual immersion in the molten zinc.

✦ ✦ ✦

EARLY galvanizers found that these iron salts left on the surface after pickling created coating troubles so they then employed a muriatic acid dip. This dip, while they did not understand the chemistry of what happened, slowed down oxidation after pickling in the sulphuric acid, and tended to do two things, namely, first, to change the insoluble iron oxides into iron chlorides which are soluble; and second, to greatly reduce corrosion on the surface by allowing the time required for the chlorides to be very slowly changed over into "sull" or water rust, the light yellow color familiar to all galvanizers on the surface of the work while draining and drying and waiting to go into the pot.

✦ ✦ ✦

AT this point, however, it is necessary to call attention to the great damage done by this corrosion, and the iron salts from the pickle and acid dip. A chemical analysis of the molten sal-ammoniac flux on the bath reveals the fact that it seldom contains an appreciable amount of iron. This means, of course, that the iron in the corrosion then is reduced by the molten zinc and forms zinc-iron alloy commonly known as "galvanizer's dross". Research investigations have not only definitely proven this fact but they have also proven that the freed oxygen oxidizes part of the molten zinc at the same time, thereby greatly increasing the oxide skimmings made.

✦ ✦ ✦

AS constant research work was carried on in fluxing methods and practice, corrosion development in its relation to dross and oxide skimming production, it was soon realized that all work should be thoroughly rinsed after pickling for the purpose of washing off all of the iron salts, and also to suppress the oxidizing effect left from the acid. One thing that was not realized was the fact that in the chemical changes taking place in the development of corrosion, the iron passed through the hydroxide stage, giving a sticky material that even washing would not entirely remove. Thus even the introduction of rinsing did not entirely solve all of the old fluxing troubles because of these hydroxide iron salts that could not be eliminated even by a rinsing operation.

✦ ✦ ✦

TO keep the matter clear, it is reminded that the first iron salts are the soluble sulphate and chloride, whereas the middle and last corrosion products are the insoluble iron hydroxides and iron oxides. High dross production has therefore been traced directly to these insoluble iron salts or corrosion products remaining on the surface when the article enters the molten zinc bath. Slow drying developed the green ferrous sulphates and chlorides which gradually turned to the light yellow "sull" and water rust (limonite), and finally to the red rust if allowed to stand in the air for long periods of time. Fast drying on the furnace developed the very dark brown, red-brown, or dark olive-green bronze rust, or corrosion product (iron oxide) which is an almost perfect insulator to keep the zinc from alloying with the iron base metal. The lighter corrosion products and the "sull" rust are easily reduced by the molten zinc and the iron forms dross (zinc-iron alloy). The proper fluxing procedure therefore requires that no iron of any kind be allowed to form on the iron surface after it has once been made perfectly clean by pickling. A reduction of dross from 42 percent to 8 percent in one plant was directly caused by entirely eliminating this iron due to corrosion in draining and drying. Also, in considering

MODEL 25 W — 12½T

PROMPT DELIVERIES WIT

This new National T Type St
veloped after long careful
needs of the Wire and Ca

THE new variable speed haul-off is designed to give any lay desired without the use of change gears. Lays may be varied in increments of 1/100 of one inch from ¼" up to and including 16½" by the adjustment of a small readily accessible hand wheel.

✦ ✦ ✦

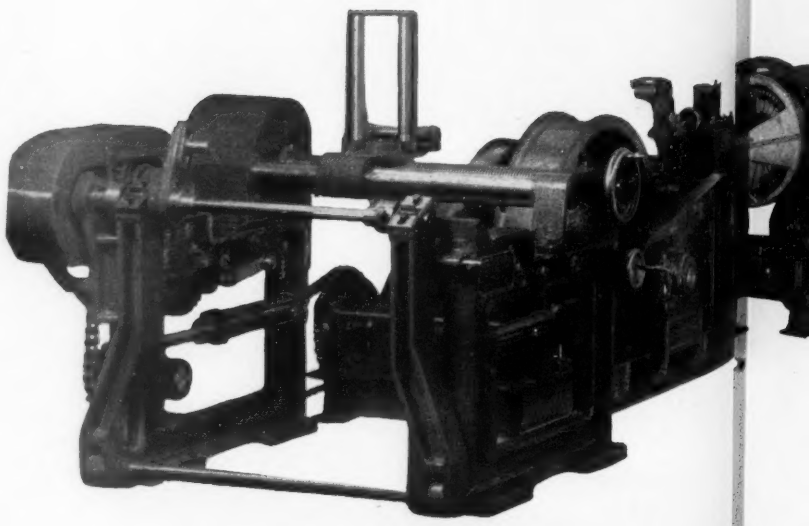
AN electrically controlled clutch is used to insure the proper direction of haul-off capstan when changing from right to left lays, and does not require any changes on the part of the operator.

✦ ✦ ✦

THE thrust bearings and gears in the rear pedestal are lubricated by an oil injector, which keeps a continuous supply of oil on these parts while the Strander is in operation.

✦ ✦ ✦

Let Us Quote
On Your Wire
Machinery
Requirements



There are embodied this ne
Strander, the sugges of En
Operators of numerants thr
country, and all have the dev
a machine to meet t st exact
ments of the Industr

TIME ELEMENT from full speed to op varies

NATIONAL RUBBE

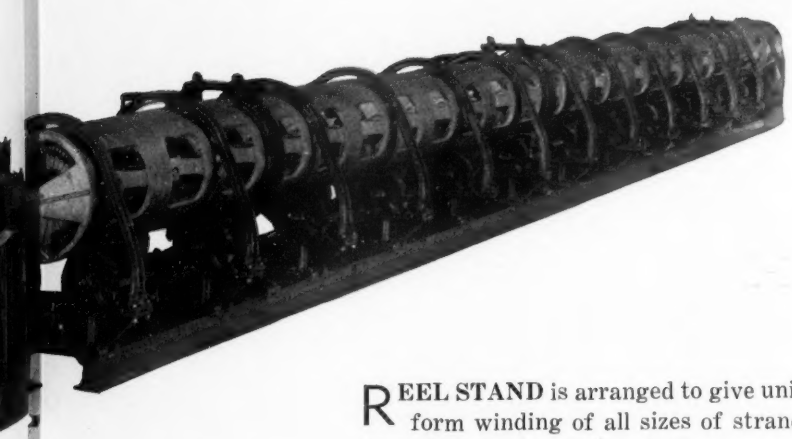
General Offic AKR

Banner Division, COLUMBIANA, OHI
Eastern Division CLIFTON, N. J.

½T TYPE STRANDER

SWITHIN EIGHT WEEKS

l T Type Strander was de-
ng careful study of the
re l and Cable Industries.



REEL STAND is arranged to give uniform winding of all sizes of strand on reels of various diameters.

✦ ✦ ✦

REELS WHEN LOADED, are lowered to floor by means of self-contained hydraulic cylinders attached to lowering arms. The empty reels are raised into position by hydraulic pistons.

✦ ✦ ✦

THIS same improved design is embodied in the development of our 7, 12, 19 and 25 Wire Stranders, and includes the following range of Bobbin sizes: 4″, 9″, 12″, 16″, 21″ and 22″.

TEXTILITE TUBE ROLLERS minimize the wear on the tubes, as well as insure quiet operation. These rollers as well as all other parts throughout the machine, are mounted on Standard Ball Bearings.

✦ ✦ ✦

CARBOLOY WIRE GUIDES are used to eliminate wear—thus eliminating replacements during long periods of operation.

✦ ✦ ✦

THE BOBBIN LATCHES and BRAKES are novel, as they are practically automatic in operation.

✦ ✦ ✦

ELECTRIC BRAKES are manually operated by use of a push button during normal operation, but are automatically operated, and the power shuts off the entire unit when a break occurs in any individual wire, or bobbin runs out.

✦ ✦ ✦

Let Us Quote
On Your Wire
Machinery
Requirements

odie this new National
ngge of Engineers and
nerc ants throughout the
nave the development of
et t st exacting require-
ustr

to top varies from seven to twelve seconds.

E MACHINERY CO.

fic AKRON, OHIO

HI David Bridge & Company, Ltd., Manchester, England
The Bawden Machine Company, Ltd., Toronto, Canada

dross production, it should be borne in mind that the kind of base material and the surface area are two very important factors to be considered.

✦ ✦ ✦

BEFORE leaving the discussion of the old method of fluxing, attention is also called to the fact that some work, such as castings, could be cleaned by sandblasting or wheelabrating. Such work has a perfectly clean, bare iron surface. However, from the fluxing viewpoint, attention is called to the fact that such surfaces do not go into the galvanizing bath dry. The molten sal-ammoniac flux on the bath must carry a considerable amount of water as evidenced by the puffs of steam that escape every time an article is put through it. This means, then, that dry work which has been sandblasted tends to "dry up" the slag flux quicker because the surface must be wet, and the water to wet it can only come from the molten sal-ammoniac flux, itself. This tends to make the flux dry and cakey, cause flux sticking to the surface causing flux spots, and greatly increases the amount of sal-ammoniac used in trying to keep the flux in good condition by supplying new water from the water of crystallization of the new salt added. Water is the flux lubricator, and all the chemical reactions must go on in a water condition. Dry fluxes tend to rapidly increase seconds and cause flux spots and coating troubles. Thus, the function of flux must be to wet the surface of the article so that the flux can readily slip off the surface when the article is pushed down under the surface into the bath. Dry fluxes cause the flux to stick to the surface and go down through the bath and out on the surface as a flux spot.

✦ ✦ ✦

Constant Search for a New Flux Technique

AS far back as 1920, research had revealed that water was a very vital constituent in fluxing reactions. The temperature of the galvanizing bath being around 850 degrees F. made it a difficult matter to hold water in the flux, as every article that went down through the flux was accompanied by a steam puff clearly indicating the loss of water. Even at this early date the writer had carried on extensive investigations with sal-ammoniacs and different grades of zinc-ammonium-chlorides. The thought in mind was that the zinc chloride would hold the water which was so necessary for the fluxing reaction, and the ammonium chloride would furnish the starter or material to keep the fluxing reactions going on. The new flux carried high amounts of ammonium chloride; spent fluxes showed that ammonium chloride was lost in the reactions fluxing, and the end product tended to form a by-product high in zinc chloride. All stages, of course, could be found in between. Another thing that the research investigations disclosed was that sal-ammoniac by itself escaped largely as smoke or fumes when placed on the bath, while zinc - ammonium - chloride made very much less fumes and gave the desired "puddle" of flux to carry on the reactions in. Thus, the logical line of reasoning was to turn to the various grades of zinc-ammonium-chlorides for a new fluxing material. This was done as stated as far back as 1920.

✦ ✦ ✦

A New Technique of Fluxing Gradually Appears

OTHER investigators continued to work along the same lines as it now became very clear that high dross production, high oxide skimmings, poor coating qualities, low adherence, high costs and many other factors all had their origin in the pickling, washing, drying and fluxing technique. Since the standard pickling and galvanizing practice required the use of a muriatic acid dip which, as a material in the purchasing department was very much cheaper than zinc-ammonium-chloride, it became an extremely difficult matter to break off from this fluxing practice which at once "glared out" in the form of original increased costs; this in the face of the fact that no satisfactory explanation was forthcoming from those who had already changed over to the new technique, because when carried out right, it gave them the distinct advantage of much lower costs, higher quality coatings, lower dross production and many other improved conditions such as greatly reduced fume conditions and better working conditions. However, even as late as this date, some galvanizers still are tenaciously holding to the old muriatic acid dip fluxing method.

✦ ✦ ✦

The Best Fluxing Technique for Hot Dip Galvanizing

THOSE companies that were progressive enough to take advantage of using zinc-ammonium-chloride as a flux did not reap their rewards easily, or without plenty of "headaches" and "grief". They had an idea of what they wanted to do, but in the early stages of development even those trying to introduce this new technique did not fully understand the "whys" of many things that happened. So, not being sure, it was found that in one company the new technique was a wonderful success after they had learned how to operate it; while, in another, it was a complete failure, and they went back to the old muriatic acid dip method of fluxing.

✦ ✦ ✦

THE new method of flux technique required the complete elimination of the muriatic acid dip in favor of a solution of zinc-ammonium - chloride. However, from a practical standpoint just the change of flux technique is by no means all that has to be considered. One of the fundamental questions involved is: Should this new flux be acid, neutral or alkaline in character, and why should it be the type selected. The best results are obtained when the zinc ammonium chloride solution is slightly acid, and the explanation is that this character solution tends to keep all oxides and basic zinc salts dissolved. An alkaline solution will precipitate hydroxides and basic salts out of solution, and if these are dried on the surface of the articles they will tend to insulate the molten zinc from the base metal so that no alloy bond can take place, and hence peeling

and flaking of the coating with low adherence may be expected.

✦ ✦ ✦

New Fluxing Technique Eliminates Corrosion

IT is of course vital to the operation of the new fluxing technique that it be set up right. The solution of zinc-ammonium-chloride should be held in either a wooden or acid-proof brick tank, and be heated with enclosed steam coils. These can be of Monel Metal, lead or a high grade brass. The saturation of the solution with the salt depends upon the production, surface area, kind of work and operating conditions. In some cases the saturation is low, in others it is high; in some cases the temperature carried is low, in others high, the conditions at hand showing what type of liquid flux is best suited to the work and conditions. The practical way of telling whether the solution is right is by watching the surface of the work on the dryer. If it comes out a clean, black or gray color with a salt glaze on after drying, then conditions are about right; on the other hand, if the surface quickly turns a green color, or rust of a light yellow or red color appears, then it will be known at once that conditions are not right and that corrosion products are forming on the surface. In some cases a slab of zinc is hung in each end of the liquid flux tank to take up any acid carried into it.

✦ ✦ ✦

THIS new flux technique requires that all of the iron salts be carefully washed off of the surface of the work in running water. Only running water can give a perfectly clean, uncontaminated surface, as a still water wash merely develops into another very weak acid pickle dip. It should be remembered that no oxides of any kind can remain on the surface, as these are insoluble and will harm the qualities of the zinc coating. The zinc must come in direct contact with the clean iron base to give the highest quality zinc coating.

✦ ✦ ✦

New Flux Technique Greatly Reduces Dross and Oxide Production

THE new flux technique first requires that the iron surface be cleaned perfectly by pickling; second, that any iron salts in the pickling solutions be entirely eliminated by thorough rinsing in running water; and third, that the iron surface, once made clean, is kept clean until in the molten zinc bath. Thus, this new technique not only eliminates corrosion after pickling and in drying, but it removes all of the iron that got into the galvanizing bath from any source, by the old muriatic acid dip method of fluxing. Stoppage of this iron that was the main source of iron to form dross, naturally stops the formation of the dross itself when the iron is eliminated. Fluxing reactions might be thought of as hot pickling, or pickling at a high temperature. The flux on the bath contains water and muriatic acid, and the liquid flux coating prevents any corrosion from forming on the surface of the iron by corrosion in the air, once it has been cleaned. The elimination of the iron oxide also reduces or eliminates the oxygen also that came in with the corrosion, and which, when freed as the iron went into dross, was ready to destroy good zinc and form oxide skimmings. Thus, this new flux technique greatly reduces both dross and oxide skimming production.

✦ ✦ ✦

New Flux Results

THE results of the new flux technique are cumulative in their benefits. For example, a lower bath temperature can be carried because the flux does not stick to the work, and because there is no corrosion that the zinc has to destroy. All the defects of the old flux method required a higher operating bath temperature to overcome the difficulties. None of these exist with the new flux technique and, hence, the bath temperature can be lower. This in turn saves fuel, saves the furnace and gives a longer pot life. Because all the work is first quality, the production is higher; and because operating conditions are better, less sal-ammoniac and all other materials are required, greatly reducing the materials per ton costs. Zinc losses are eliminated. The zinc lost in forming excessive dross and oxide skimmings with the new technique is used for coating, where it should be. Materials costs show saving because of lower amounts; production shows an increase because of fewer seconds and rejects; fuel costs are lower because of lower bath temperatures being possible; pot life and furnace life are longer because of lower bath temperatures and less drastic operating conditions; and fumes are less because less sal-ammoniac is required, and this is the fume making material.

THE WIRE ASSOCIATION

WHAT IT GIVES YOU FOR $10.00 ANNUAL DUES

1. **WIRE & WIRE PRODUCTS — For One Year.**
   The official publication of The Wire Association covering the Wire Industry; its Metallurgy, Technology, Research, Processes, Machinery and Personnel.
2. **THE ANNUAL BUYERS GUIDE & YEAR BOOK OF THE WIRE ASSOCIATION.**
   The Year Book Section contains: Constitution and By-Laws of The Wire Association; Details of year's meetings, etc.; List of Members, Index to Papers and Articles in WIRE & WIRE PRODUCTS.
3. **QUESTION AND ANSWER SERVICE.**
   Answers to technical and operating problems direct by mail. Available to members only.
4. **ANNUAL CONVENTION AND EXHIBITION.**
   (In Association with American Society for Metals and The National Metal Congress.) Technical Sections, Plant Inspections.
5. **REGIONAL MEETINGS.**
   Attendance at the regional meetings which include Local Plant Inspections, Technical Sessions and Discussions.
6. **PERSONAL CONTACTS.**
   Both at Annual and Regional Meetings, and throughout the year, for interchange of helpful information.
7. **INFORMATION SERVICE ON MACHINERY, EQUIPMENT AND SUPPLIES.**
   The Technical, Catalogue and Correspondence Files of the Wire Association hold the answer to practically every "Where can I buy" problem. This service is available to members without charge.

For detailed information address
RICHARD E. BROWN—Executive Secretary
300 Main Street, Stamford, Conn.

STATISTICS --- 1st QUARTER --- 1940

PRODUCTION FOR SALE OF IRON AND STEEL PRODUCTS

35-200-3.40.

AMERICAN IRON AND STEEL INSTITUTE
Capacity and Production for Sale of Iron and Steel Products

First Quarter - 1940
PERIOD

		Number of companies	Items	Annual Capacity Net tons	Production for Sale—Net Tons: Current Month — Quarter: Total	Current Month — Quarter: Per cent of capacity	Current Month — Quarter: Shipments: Export	Current Month — Quarter: Shipments: To members of the industry for conversion into further finished products	To Date: Total	To Date: Per Cent of capacity	To Date: Shipments: Export	To Date: Shipments: To members of the industry for conversion into further finished products
STEEL PRODUCTS	Ingots, blooms, billets, slabs, sheet bars, etc.	32	1	xxxxxxx	1,073,843	xxx	316,210	364,615		xxx		
	Heavy structural shapes	8	2	5,205,300	536,714	41.5	40,746	-				xxxxxxx
	Steel piling	4	3	328,000	29,178	35.8	3,133	-				xxxxxxx
	Plates—Sheared and Universal	19	4	5,855,450	880,496	60.5	87,843	10,098				
	Skelp	7	5	xxxxxxx	118,204	xxx	20,162	39,548		xxx		
	Rails—Standard (over 60 lbs.)	4	6	3,647,600	490,614	54.1	21,205	-				xxxxxxx
	Light (60 lbs. and under)	6	7	306,800	25,180	33.0	6,985	-				xxxxxxx
	All other (Incl. girder, guard, etc.)	2	8	118,000	10,976	37.4	1,420	-				xxxxxxx
	Splice bar and tie plates	14	9	1,300,200	166,156	51.4	2,755	-				xxxxxxx
	Bars—Merchant	35	10	xxxxxxx	1,045,903	xxx	79,151	86,720		xxx		
	Concrete reinforcing—New billet	14	11	xxxxxxx	226,072	xxx	75,061	-		xxx		xxxxxxx
	Rerolling	18	12	xxxxxxx	27,030	xxx	3,478	-		xxx		xxxxxxx
	Cold finished—Carbon	18	13	xxxxxxx	163,632	xxx	2,477	-		xxx		xxxxxxx
	Alloy—Hot rolled	15	14	xxxxxxx	207,557	xxx	12,924	15,429		xxx		
	Cold finished	14	15	xxxxxxx	23,496	xxx	490	-		xxx		xxxxxxx
	Hoops and baling bands	5	16	xxxxxxx	21,317	xxx	1,196	-		xxx		xxxxxxx
	TOTAL BARS	53	17	12,355,730	1,715,007	55.8	174,777	102,149				
	Tool steel bars (rolled and forged)	15	18	110,220	16,596	60.6	732	-				xxxxxxx
	Pipe and tube—B. W.	13	19	1,665,860	196,154	47.4	21,060	-				xxxxxxx
	L. W.	10	20	1,360,360	73,113	21.6	9,822	-				xxxxxxx
	Electric weld	5	21	731,520	53,719	29.5	6,974	-				xxxxxxx
	Seamless	15	22	3,347,590	455,401	54.7	45,580	-				xxxxxxx
	Conduit	5	23	133,145	15,006	45.3	551	-				xxxxxxx
	Mechanical Tubing	12	24	367,475	52,273	57.2	2,986	-				xxxxxxx
	Wire rods	19	25	xxxxxxx	253,839	xxx	60,407	38,691		xxx		
	Wire—Drawn	37	26	2,255,350	336,122	59.9	40,395	5,057				
	Nails and staples	19	27	1,091,690	133,441	49.2	14,664	-				xxxxxxx
	Barbed and twisted	16	28	438,270	41,712	38.3	6,372	-				xxxxxxx
	Woven wire fence	15	29	772,791	57,518	29.9	612	-				xxxxxxx
	Bale ties	11	30	119,050	11,331	38.3	45	-				xxxxxxx
	All other wire products	6	31	27,030	2,286	34.0	-	-				xxxxxxx
	Fence posts	12	32	145,800	11,429	31.5	230	-				xxxxxxx
	Black plate	12	33	653,295	91,953	56.6	3,941	31,287				
	Tin plate—Hot rolled	9	34	1,201,960	144,319	48.3	51,283	-				xxxxxxx
	Cold reduced	10	35	2,930,860	554,495	76.1	122,503	-				xxxxxxx
	Sheets—Hot rolled	26	36	xxxxxxx	1,334,759	xxx	134,978	40,306		xxx		
	Galvanized	16	37	xxxxxxx	309,137	xxx	45,392	-		xxx		xxxxxxx
	Cold rolled	18	38	xxxxxxx	570,661	xxx	25,875	-		xxx		xxxxxxx
	All other	15	39	xxxxxxx	149,856	xxx	4,679	-		xxx		xxxxxxx
	TOTAL SHEETS	27	40	13,233,770	2,364,413	71.8	210,924	40,306				
	Strip—Hot rolled	24	41	3,524,750	350,929	40.0	19,401	41,632				
	Cold rolled	35	42	1,305,360	177,088	54.6	4,592	-				xxxxxxx
	Wheels (car, rolled steel)	5	43	419,035	58,853	56.5	1,649	-				xxxxxxx
	Axles	5	44	472,280	27,909	23.8	1,350	-				xxxxxxx
	Track spikes	11	45	327,275	29,595	36.4	1,505	-				xxxxxxx
	All other	4	46	9,100	3,095	136.8	-	-				xxxxxxx
	TOTAL STEEL PRODUCTS	133	47	xxxxxxx	10,558,957	xxx	1,302,814	673,383		xxx		
	Estimated total steel finishing capacity based on a yield from ingots of 68.9 %	-	48	53,714,800	xxxxxxx	74.0	xxxxx	xxxxxxx	xxxxxxx		xxxxxxx	xxxxxxx
	Pig iron, ferro manganese and spiegel	27	49	xxxxxxx	1,309,597	xxx	76,958	357,225		xxx		
	Ingot moulds	4	50	xxxxxxx	87,238	xxx	453	-		xxx		xxxxxxx
IRON PRODUCTS	Bars	9	51	160,600	7,974	20.0	34	704				
	Pipe and tubes	3	52	109,377	8,647	31.8	370	-				xxxxxxx
	All other	2	53	71,180	3,294	18.6	810	1,004				
	TOTAL IRON PRODUCTS (ITEMS 51 to 53)	11	54	276,247	19,915	29.0	1,214	1,708				

Total number of companies included - 153.

Total steel products produced for sale, less shipments to members of the industry for conversion into further finished products: Current Month — Quarter 9,885,574 N.T.; 74.0 % of Finishing Capacity.
To date ____ N.T.; ____ % of Finishing Capacity.
The above tonnages represent 68.9 % of the ingots produced by companies whose products are included above.

If You Are Not A Member Of The Wire Association—Now Is A Good Time To Join!

The Annual Dues Are $10.00

For detailed information address

RICHARD E. BROWN, Secretary

THE WIRE ASSOCIATION

300 Main Street, Stamford, Conn.

Outstanding Personalities of the Wire Industry

H. W. Clough Elected Belden Vice-President

WHIPPLE JACOBS, President of Belden Manufacturing Company, Chicago, announces the election of Herbert W. Clough as Vice-President in Charge of Sales.

✦ ✦ ✦

THIS latest promotion comes to Mr. Clough after 18 years of service with Belden. Starting in April, 1922, he gained a broad picture of the business in the production division and inside sales department. As salesman, he represented the company in the Chicago district and later supervised government orders and Canadian sales.

✦ ✦ ✦

AFTER a year in this capacity, Mr. Clough was made Manager of Merchandise Sales and entrusted with the task of developing Belden's jobbing program. This division has grown to a place where it represents approximately 20% of Belden's business.

✦ ✦ ✦

ABOUT a year ago, Mr. Clough succeeded Whipple Jacobs as General Sales Manager when the latter was elected president.

✦ ✦ ✦

W. E. Borbonus, President, R-S Products Corporation

THE R-S Products Corp., Philadelphia, Pa., announces the following changes in their executive personnel: **W. E. Borbonus** has replaced **F. J. Ryan** as President of the R-S Products Corporation, Philadelphia, Pa., who have been manufacturing Ryan-Scully Heat Treating Furnaces, Burners, Gate Valves, and Control Equipment since 1908; D. E. Wyman is the new Vice-President and Chief Engineer. He was formerly Chief Engineer of the Industrial Furnace Division of the Philadelphia Drying Machinery Company.

✦ ✦ ✦

Robert S. Peare, Manager, Publicity Dept., General Electric Company

ROBERT S. PEARE, president and general manager of the Maqua Company, a large printing and engraving concern affiliated with General Electric in Schenectady, has been named manager of the publicity department of the General Electric Company. He will assume his new duties at once, succeeding Chester H. Lang, who becomes manager of apparatus sales for the company.

H. W. CLOUGH
Vice President
Belden Manufacturing Co.

✦ ✦ ✦

MR. PEARE, a native of Bellmore, Indiana, entered the employ of the General Electric Company as a student in the accounting department two months after graduating from the University of Michigan in 1922. The following May he was transferred to the advertising department where he remained until September 1, 1923, when he returned to the statistical section of the accounting department and a year later became assistant to the chief statistician. In October, 1926, he was elected secretary-treasurer of the Maqua Company and three years later became general manager. On January 1, 1934, he was elected president and has continued to fill these positions to the present time.

✦ ✦ ✦

E. E. Swartswelter Elected President of The Aetna-Standard Engineering Co.

A NUMBER of changes in the official staff and in the directors of the Aetna-Standard Engineering Company, important maker of rolling mill machinery, was effected at the annual stockholders' meeting held at Youngstown. Ernest E. Swartswelter, for years a stock broker in Youngstown, was elected president and chairman, succeeding Jerome R. George, who came here several years ago from Worcester, Mass., to fill these posts. R. J. Wean, now head of the Wean Engineering Co., of Warren, was at one time active in the Aetna-Standard company. Officers who were reelected include C. G. Ohlson, vice president; L. L. Dalbey, secretary-treasurer, and J. J. Guy, assistant secretary and assistant treasurer.

✦ ✦ ✦

Chester H. Lang, Manager, Apparatus Sales, General Electric Co.

CHESTER H. LANG, manager of General Electric's advertising and sales promotion activities since 1932, has been named manager of apparatus sales and vice chairman of the Company's Apparatus Sales Committee, it was announced today by Vice President E. O. Shreve. The apparatus or capital goods lines range from big turbines to tiny motors.

✦ ✦ ✦

AS advertising manager, and a member of both the apparatus and appliance sales committees Mr. Lang has been intimately associated with all commercial activities of the company. He organized its market research bureau in 1932, a section devoted to sales analysis of existing and contemplated products.

This is an invitation for you to become a member of The Wire Association.

The Annual Dues are $10.00

✦ ✦ ✦

The 1940 Convention will be held in October at Cleveland, O.

✦ ✦ ✦

For Details Address

Richard E. Brown, Secretary
The Wire Association
300 Main St. Stamford, Conn.
Stamford Trust Co. Bldg.

Exports and Imports of Wire

Exports of Iron and Steel Wire Products in March 1940 and March 1939
(In Gross Tons)

	MARCH 1940	FEB. 1940	MARCH 1939
Wire rods	19,124	14,417	2,654
Strip steel	17,360	13,559	4,090
Plain, black or galvanized iron or steel wire	13,802	10,567	4,927
Barbed wire and woven wire fencing	2,449	2,014	3,768
Woven wire screen cloth	276	296	167
Wire rope	1,011	705	288
Insulated iron or steel wire and cable—see analysis below			
Other wire and manufactures	1,343	1,981	577
Wire nails	4,254	4,275	1,497
Tacks	65	71	21
Other nails, including staples	419	239	351
Bolts, machine screws, nuts, rivets and washers	1,199	1,185	774
Total, these 11 classifications	61,302	49,309	19,114

Imports of Iron and Steel Wire into the United States
(In Gross Tons)

Concrete Reinforcement bars	7	.....	183
Hollow bar and drill steel	186	196	134
Wire rods	930	499	821
Barbed wire	.....	.....	2,065
Round iron and steel wire	170	120	348
Telephone and telegraph wire	.....	.....	.....
Flat wire and strip steel	336	237	296
Wire rope and strand	97	82	126
Other wire	.....	.....	155
Hoops and bands	100	52	1,867
Nails, tacks and staples	21	7	757
Bolts, nuts and rivets	53	19	18
Total, these 12 classifications	1,900	1,212	6,770

Exports of Insulated Wire and Cable, March 1940

	Foreign		To U. S. Possessions	
	Pounds	Dollars	Pounds	Dollars
Rubber-covered wire	5,264,485	$1,554,345	117,148	$ 35,597
Weatherproof wire	153,350	29,807	87,678	16,309
Other insulated copper wire	1,578,252	407,927	282,492	50,110
Nickel-chrome electric resistance wire	127,868	145,409	7	33
Total, these 4 classifications	7,123,955	$2,137,488	487,325	$102,049

Iron and Steel Exports Increase Continued Decline in Imports

FURTHER gains were recorded in the United States' export trade in iron and steel products (excluding scrap) in March when shipments totaled 457,052 gross tons valued at $34,220,853. In February this trade had set a modern record of 436,585 tons valued at $33,361,201, while in March 1939 only 162,098 tons of iron and steel valued at $12,569,693 had been exported.

✦ ✦ ✦

FIRST quarter iron and steel exports—1,289,701 tons valued at $98,735,419 — were virtually three times as great in tonnage and were more than three times as valuable as those of the January-March period of 1939—431,663 tons valued at $32,556,947.

SHIPMENTS to every continental area rose in March as compared with February. The trade with Europe climbed to 153,326 tons from 146,447 tons in the month preceding, South America took 125,874 tons against 119,639 tons, shipments to the Far East were reported at 89,337 tons against 83,260 tons, North and Central America and the West Indies took 73,870 tons against 72,662 tons, with shipments to Africa higher by the narrow margin of 14,645 tons against 14,577 tons.

✦ ✦ ✦

Imports Continue Lower

IMPORTS of iron and steel products (scrap excepted) into the United States again declined sharply in March when but 5,067 gross tons were received. This total was an even 1,400 tons under the February 1940 trade of 6,467 tons, but its value — $813,303 — topped that of February $666,212 — by $147,091. A year before — in March 1939 — imports of iron and steel products had totaled 24,589 tons valued at $1,478,623.

✦ ✦ ✦

THREE months receipts—19,366 tons valued at $2,398,201—are but 29 percent by weight and 54 percent by value of those of the January-March period of 1939 — 66,656 tons valued at $4,429,827.

✦ ✦ ✦

Scrap Exports Down

DOWN 12 percent in quantity and 18 percent in value exports of scrap from the United States in March totaled only 206,928 gross tons valued at $3,387,037. February shipments had amounted to 234,716 tons valued at $4,137,635, while those of March 1939 had amounted to 312,262 tons valued at $4,640,598.

✦ ✦ ✦

FIRST quarter scrap exports—629,101 tons valued at $11,091,893—were 17.7 percent smaller in quantity but only 2.2 percent less in value than those of the January-March period of 1939 — 765,059 tons valued at $11,337,293.

✦ ✦ ✦

United Kingdom Leading Purchaser

EACH of the five leading markets (in point of tonnage purchased) took more iron and steel in March than in February—the United Kingdom took a total of 78,828 tons (68,130 tons in February) which consisted mainly of non-alloy ingots, 57,397 tons and pig iron, 16,617 tons. The main items of Argentina's 47,859-ton trade (43,281 tons) were 7,553 tons of non-alloy "other" steel bars, 6,543 tons of non-alloy "black" steel sheets, 4,780 tons of black iron sheets, 4,207 tons of concrete reinforcement bars, and 4,128 tons of wire rods. Included in Canada's total of 46,266 tons (40,586 tons) were 9,094 tons of non-alloy 'other' plates, 6,776 tons of non-alloy "black" steel sheets, 5,006 tons of non-alloy ingots, 4,285 tons of plain shapes and 3,950 tons of non-alloy hot-rolled strip. Brazil took 35,563 tons against 30,547 tons in

February, and Japan took 22,174 tons against 10,952 tons.

✦ ✦ ✦

Scrap Exports Lower

SCRAP exports dropped to 206,928 gross tons in March from 234,716 tons in February, Japan, normally the chief purchaser of iron and steel scrap, was relegated to third place among the buyers of that raw material. The chief markets were the United Kingdom, 73,937 tons; Italy, 48,258 tons; Japan, 40,965 tons; Canada, 17,924 tons and Spain, 14,921 tons. The 206,928 ton-total includes 205,041 tons of iron and steel scrap, 702 tons of tin plate scrap, 533 tons of tin plate circles, etc., 466 tons of waste-waste tin plate, and 186 tons of terne plate clippings and scrap.

✦ ✦ ✦

Imports Continue to Decline

THE principal item in the March import trade was 930 tons of wire rods which was furnished entirely by Sweden. Ferromanganese ranked second in point of tonnage with Norway the source of the entire 835 tons. Sweden's 576 tons of, principally, ball bearing tubing, was the leading factor in the 612-ton trade in "other" pipe.

✦ ✦ ✦

Sweden Leading Supplier

SWEDEN was the month's leading supplier with a total of 2,716 tons which included 930 tons of wire rods, 576 tons of "other" pipe, and 336 tons of flat wire and steel strips. Norway ranked second with ferromanganese, 835 tons, the chief item in the 880-ton trade. A total of 579 tons placed Belgium in third place in which structural shapes, 235 tons; solid or hollow bars, 160 tons; and other hoops and bands, 99 tons, were the most important. British India's trade of 409 tons was made up entirely of pig iron.

✦ ✦ ✦

CARD Clothing: 15,041 square feet and $21,287 (16,277 square feet, $24,298). 14,661 square feet at $20,457 came from the United Kingdom, 230 square feet at $535 came from France, and 150 square feet at $295 came from Switzerland.

WIRE Cloth and Screening: 10,532 square feet (22,365 square feet) furnished entirely by Netherlands, 7,919 square feet, and Canada, 2,613 square feet.

✦ ✦ ✦

WIRE Fencing and Netting: Galvanized before weaving: None (none). **Galvanized after weaving:** None (5,500 square feet).

✦ ✦ ✦

FOURDRINIER: 13,841 square feet (11,376 square feet). France furnished 10,186 square feet and Sweden furnished the remaining 3,655 square feet).

✦ ✦ ✦

WIRE Heddles: 31,000 pieces (155,000 pieces) which came entirely from Belgium.

✦ ✦ ✦

Wood Screws

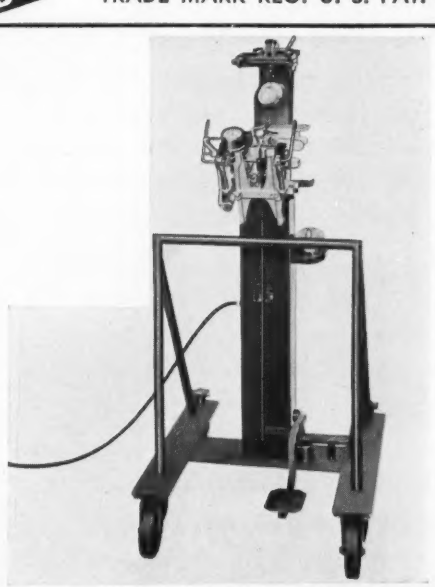
EXPORTS of iron and steel wood screws during March 1940 totaled 48,045 gross valued at $8,587. Of this total, Colombia took 13,475 gross valued at $2,200; Mexico, 5,446 gross valued at $561; France, 3,861 gross valued at $740; Canada, 3,369 gross valued at

MICROMETER PRECISION MICRO-WELD TRADE MARK REG. U. S. PAT. OFF.

CONTINUOUS IMPROVEMENT

MICRO-WELDERS with dial indicating annealing attachments are now available for high carbon wire.

There is positive control of annealing temperature and already hundreds of these special MICRO-WELDERS are proving their dependability and satisfactory performance with leading manufacturers.



MICRO PRODUCTS COMPANY
20 NORTH WACKER DRIVE, CHICAGO, ILL.
Telephone, State 7468

The Modern Method That Utilizes

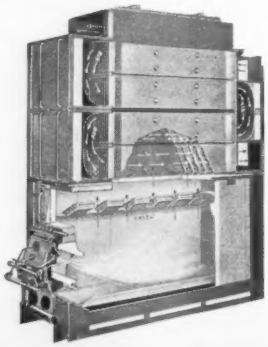
HIGH TEMPERATURE AIR

free from products of combustion

By circulating clean heated air free from products of combustion the Ross Wire and Rod Baker dries your product in much less time and entirely without the rusting often caused by other methods of baking. The lime coat with this improved type of air heating and circulation dries to a soft smoothness which prolongs the life of the drawing dies.

Ross Indirect Air Heaters are designed to supply heated air free from combustion gases. They are supplied for use with any gas or oil fuel available.

Whether your requirements are for a new baker or the revamping of your present unit, write us for particulars.



J. O. ROSS ENGINEERING CORPORATION

350 MADISON AVE., NEW YORK, N. Y.

CHICAGO, ILL. DETROIT, MICH. PITTSBURGH, PA.

ROSS ENGINEERING OF CANADA, LTD., Dominion Square Building, Montreal

$382; Ecuador, 3,320 gross valued at $510; Argentina, 2,100 gross valued at $247; Bolivia, 1,800 gross valued at $295; Salvador, 1,600 gross valued at $263; Cuba, 1,425 gross valued at $336; Netherlands West Indies, 1,370 gross valued at $232; Venezuela, 1,196 gross valued at $327; Republic of Panama, 1,107 gross valued at $193.

✦ ✦ ✦

EXPORTS of brass wood screws during the same period totaled 14,144 gross valued at $8,633. Of this total Panama Canal Zone took 8,120 gross valued at $4,396; Netherlands Indies, 2,288 gross valued at $2,357; Netherlands West Indies, 926 gross valued at $555; Brazil, 725 gross valued at $98; Canada, 569 gross valued at $258; Cuba, 338 gross valued at $188; Colombia, 236 gross valued at $185; Peru, 200 gross valued at $47; Costa Rica, 170 gross valued at $79; Mexico, 165 gross valued at $141; Guatemala, 116 gross valued at $96.

✦ ✦ ✦

IMPORTS of wood screws during the same month totaled 71 gross valued at $28, supplied by France.

✦ ✦ ✦

Wire Mill Performance Reports

A NEW booklet has just been issued by the Magnus Chemical Company, Garwood, New Jersey, under the above title. The booklet contains a series of detailed performance reports from ferrous and non-ferrous wire mills outlining improvements and economies effected by the use of properly selected wire drawing compounds as contrasted with previously used methods. This is a collection of typical reports showing from direct data obtained from mill tests, the economies and improvements in results obtained by users of Magnus Wire Drawing Lubricants.

✦ ✦ ✦

SOME of the lubricants described in the report have been especially developed to meet the particular requirements of some one mill as it has been found that even upon similar work different operators have different preferences.

Attendance List — Pittsburgh Regional Meeting

(Continued from Page 306)

McINERNY, W. I., Supt.,
Heat Treating & Cold Drawing,
Pittsburgh Crucible Steel Co.,
Midland, Pa.
McLEAN, THOMAS A., Firthaloy Office,
Firth-Sterling Steel Co.,
McKeesport, Pa.
NICKLAS, T. E., Sales Engineer,
Lee Wilson Engineering Co.,
Cleveland, Ohio.
NICODEN, PAUL T., Asst. Works Mgr.,
Page Steel & Wire Div.,
American Chain & Cable Co.,
Monessen, Pa.
NITCHIE, CLIFFORD W., Firthaloy Engr.,
Firth-Sterling Steel Co.,
McKeesport, Pa.
NEUMAN, DANIEL, Products Devl. Engineer,
Pittsburgh Steel Co.,
Monessen, Pa.
OLSEN, INGVALD, Sales,
Firth-Sterling Steel Co.,
Chicago, Illinois.
OLSON, A. A., Asst. Supt.,
Bethlehem Steel Co.,
Johnstown, Pa.
ORR, CHAS. P., Sales Mgr.,
Standard Industrial Compounds Co.,
Chicago, Illinois.
PARKIN, W. M., President,
Wm. M. Parkin Company,
Pittsburgh, Pa.
PARSER, G. A., President,
A. G. Parser, Inc.,
New York, N. Y.
PATTERSON, J. W., Metallurgist,
Youngstown Sheet & Tube Co.,
Youngstown, Ohio.
PETERSON, CHAS. A., Plant Supv.,
Ind. Relations,
American Steel & Wire Co.,
Braddock, Pa.
POLLOCK, RUSELL T., Prod. Mgr.,
Pittsburgh Screw & Bolt Company,
Pittsburgh, Pa.
POOLE, E. J., Supt.,
Carpenter Steel Company,
Reading, Pa.
POWELL, WILLIAM P., Supt.,
Spring Products Corp.,
Long Island City, New York.
PRESTON, R. R., Supt. Wire Mill,
Page Steel & Wire Div.,
American Chain & Cable Co.,
Monessen, Pa.
RASP, JOHN H., Supt. Die Shop,
Firth-Sterling Steel Company,
McKeesport, Pa.
REEDER, A. M., Met. Engineer,
Jones & Laughlin Steel Corp.,
Pittsburgh, Pa.
REILLEY, E. M., JR.,
311 Morewood Ave.,
Pittsburgh, Pa.
RICHARDS, J. S., Mgr. Met. Dept.,
American Steel & Wire Co.,
Cleveland, Ohio.
ROBERTSON, F. R., Sales Mgr.,
Edward W. Voss,
Dormont, Pittsburgh, Pa.
ROEMER, H. A., JR., Mgr. Rod & Wire Sales,
Pittsburgh Steel Company,
Pittsburgh, Pa.
ROGERSON, J. E., Plant Ind. Engr.,
American Steel & Wire Co.,
Braddock, Pa.
ROLLE, SIDNEY, Asst. Mgr.,
Scomet Engineering Company,
New York, N. Y.
RUFF, RUSSELL J., Plant Met.,
American Steel & Wire Co.,
Donora, Pa.
RUSSELL, P. R., Sales,
American Chemical Paint Co.,
Ambler, Pa.
SCHAEFER, J. G., Manager,
Wyckoff Drawn Steel Co.,
Ambridge, Pa.
SCHLENSENER, E., Asst. Supt.,
Oliver Iron & Steel Corp.,
Pittsburgh, Pa.
SCHMIDT, R. H., Supt.,
Eaton Mfg. Company, Plant #2,
Massillon, Ohio.
SCHNEID, WALTER, Supt. Rolling Mills,
Rustless Iron & Steel Corp.,
Baltimore, Maryland.
SCHULTZ, WM. J., Chief Engr.,
Firth-Sterling Steel Co.,
Glassport, Pa.
SEBURN, WM. A., Supt. Wire Mill,
Pittsburgh Steel Company,
Monessen, Pa.

(Please turn to Page 329)

Wire with Honors!

Before going to work in your plant every Keystone wire *must* graduate with honors. A critical faculty of metallurgists and engineers sees to that.

Whether it's a regularly stocked wire or one created specifically for your product, you'll find this wire equal to a highly responsible job. We can supply the degrees you want in tensile strength, analysis and finish—with UNIFORMITY.

You don't have to take chances. Keystone wire is going through many production lines today . . . with honors. Let us show you why.

KEYSTONE

STEEL & WIRE CO., Dept. W. PEORIA, ILLINOIS

HIGH CARBON or LOW CARBON

Bright . . . Tinned
Coppered
Annealed
Galvanized

SAMSON SPRING WIRE
REG. U.S. PAT. OFF.
KEYSTONE STEEL & WIRE CO. PEORIA, ILL.

13 IS *lucky* FOR THE PUMP BUYER!

What to look for in hydraulic pumps . . . Thirteen points that are a guide to good buying:

1. Plungers of non-rust steel, guided above and below the plunger packings with long bronze guide bushings insuring perfect alignment and long life to plungers.
2. Deep packing chamber and low plunger speed insure long packing life.
3. All bearings of large diameter and long length giving low bearing pressures.
4. Knuckle joint bearings, bronze-lined and running in oil, take full pressure inside of cross-head; pin bearings not used.
5. Cross-heads guided with adjustable, large area cast iron shoes. These are mounted in a cross-head guide support made in two parts to facilitate assembling and dismantling whenever required.
6. Drive pinion cut integral with pinion shaft which is mounted in Timken roller bearings of generous proportions.
7. Pump chamber is a solid forged steel block with all passages drilled from the solid.

8. **AVOID TROUBLE,** PLAY SAFE

Robertson Pumps have all the features foregoing and following. Let the name "ROBERTSON" guide your buying and watch costs go down!

9. Valve checks and valve seats are of special forged bronze and of large size, giving a very low velocity to water passing over valves and valve seats.
10. Eccentric shaft of steel forging with all bearings lined with bronze; large outboard shaft bearing provided to properly support gear-drive and insure perfect alignment.
11. Full enclosed oil tight and dust-proof gear case readily removed for inspection of gears without dismantling the pump.
12. Lubrication of all shaft and eccentric bearings including pinion shaft and gear drive is automatic. An oil pump with positive drive supplies oil through a filter and sight feed oilers to all of these points.
13. Heavy box frame construction properly braced, insuring rigidity. Pump and motor base of box type construction insuring rigidity and perfect alignment.

FREE BULLETIN FULLY DESCRIBES THESE AND OTHER IMPORTANT FEATURES OF

ROBERTSON HIGH PRESSURE HYDRAULIC PUMPS

WRITE

JOHN ROBERTSON CO., Inc. 125-137 Water St., Brooklyn, N. Y.

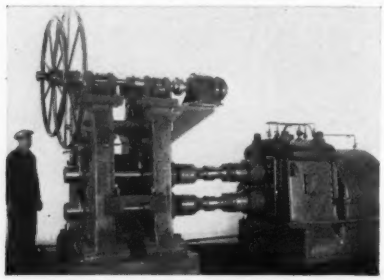
New Mill Performs Complete Range of Rolling Operations On Wide Variety of Metals

A ROLLING mill that meets some rather unusual requirements has recently been designed and built by Farrel-Birmingham Company, Inc,, machinery manufacturers of Ansonia, Conn.

✦ ✦ ✦

THIS is a 16″ x 16″ two-high mill to be used for rolling a wide variety of metals, including copper, brass, bronze, silver, nickel silver, monel metal, bi-metals and semi-precious metals. It is used for all rolling operations from breaking-down to finishing and is of heavy, rugged construction to handle large reductions.

✦ ✦ ✦



THE rolls are of forged alloy steel, heat treated to provide the proper hardness and bored to permit the internal circulation of cooling water, if desired. The housings are the closed top type, cast in one piece of Meehanite, an alloy iron of high strength and superior physical properties. They are of large section to provide the strength necessary for the work to be performed. Roll neck bearings are bronze, of the open, half hexagon, block type, carried in chocks of cast steel and arranged for water cooling. The bearings are grease lubricated by a force feed lubricator, chain driven from the main reduction drive.

✦ ✦ ✦

THE top roll is adjusted by a combination double-handwheel screwdown, to which is also connected a motor drive for rapid approximate positioning of the roll. The top roll counterbalance is hydraulic, consisting of two hydraulic cylinders located one each directly beneath the mill housings. Rams act upon lifting yokes, which support the top roll assembly

through lifting rods. Delivery and feed tables are made of Meehanite. The delivery table is surfaced with a hardened steel wearing plate and the feed table is provided with right and left hand adjustable guides. Two wipers are provided, one on each roll; these are felt-covered wooden blocks, spring loaded. A safety bar tripping device is located over the rolls for quick stopping in an emergency.

✦ ✦ ✦

Integral Drive and Pinion Stand

THE mill is driven by a 100 HP, 450 RPM, AC motor which is equipped with reversing and plugging control. The motor speed is reduced to the required roll speed by an enclosed double reduction drive, with which is combined the pinion stand. The reduction drive is the heavy duty, rolling mill type of gear unit with all gear centers in the same horizontal plane. Gears and mill pinions are of alloy steel, with continuous herringbone teeth accurately generated by the Sykes process. All shafts are mounted in anti-friction roller bearings. Drive and pinion stand housing is cast Meehanite. An oil pump, equipped with filter, driven from the high speed shaft of the gear unit, provides force feed lubrication to all gears and bearings. A Farrel Gearflex Coupling connects the motor and drive and universal spindles connect the pinion unit with the mill.

This is an invitation for you to become a member of The Wire Association. ✦ ✦ ✦ ✦ ✦ ✦

The Annual Dues are $10.00

✦ ✦ ✦

The 1940 Convention will be held in October at Cleveland, O.

✦ ✦ ✦

For Details Address

Richard E. Brown, Secretary

The Wire Association

300 Main St., Stamford, Conn.

Stamford Trust Co. Bldg.

Simplified Practice Recommendation R2-32, Bedsteads, Springs, And Mattresses, Reaffirmed

THE Division of Simplified Practice of the National Bureau of Standards has announced that Simplified Practice Recommendation R2-32, Bedsteads, Springs, and Mattresses, has again been reaffirmed without change by the Standing Committee of the Industry.

✦ ✦ ✦

EFFECTIVE originally in 1922, this recommendation established standard dimensions for straight-foot wood and metal beds, bow-foot beds, springs, and mattresses. In 1932 the Standing Committee revised the schedule, and in 1936 reaffirmed it without change.

✦ ✦ ✦

PRINTED copies of R2-32 are not available at present. Pending reprinting, mimeographed copies of the recommendation may be obtained from the Division of Simplified Practice, National Bureau of Standards, Washington, D. C.

Syncro offers you greater economy in your heavy-intermediate wire production

Greater economy is provided by Syncro type D wire drawing machines because their design permits quick and easy replacement of the preformed blue steel draw block tires. Moreover, frictionless piston ring seals on draw block shafts increases efficiency of the machine and reduces maintenance costs. Spoolers are smoothly driven by Syncro Magnetic Slip Clutches, which are virtually wear proof and which maintain practically constant wire tension. Expanding arbors eliminate destructive vibration caused by eccentric reels, resulting in less maintenance, increased reel life and greater operating efficiency.

May we send you complete information?

SYNCRO

Syncro Machine Company

Graybar Bldg., New York — McCormick Bldg., Chicago

Represented in Canada by — Canadian Elevator Equipment Co., Ltd., Toronto.

A Review of Recent Wire Patents

Patent 2,195,773, WIRE WORKING TOOL, patented April 2, 1940 by Mason Foshee, Kissimmee, Fla.

This tool includes a cross portion and a tubular shank portion, a mandrel carried by the shank portion and extending beyond the end thereof, the end face of the shank portion being inclined and having an offset notch formed in the long side of the shank portion, the bottom of the notch being in substantial alignment with the opposite, short side of the shank portion, the notch being adapted to receive the wire for coiling on the mandrel.

Complete Descriptions and Drawings of Patents May Be Had for 25 cents. Address, Wire & Wire Products, 300 Main St., Stamford, Conn.

✦ ✦ ✦

Patent 2,196,526, SPRING ASSEMBLY FOR UPHOLSTERY, patented April 9, 1940 by William W. Gleason, Chicago, Ill., assignor to Nachman-Springfilled Corporation, Chicago, Illinois, a corporation of Illinois.

The coil springs are tied to the frame structure by tie wires extending through the frame structure and around end convolutions of the springs, with the tie wires continuous. There are 11 claims.

✦ ✦ ✦

Patent 2,196,662, WIRE TREATING APPARATUS, patented April 9, 1940 by Per Hakansson, Fagersta, Sweden, assignor to National Standard Company, Niles, Mich., a corporation of Mich.

Wire cleaning and polishing devices revolve about the wire as it is drawn through the apparatus.

✦ ✦ ✦

Patent 2,196,686, METHOD OF MAKING CHAINS, patented April 9, 1940 by Frank E. Stahl, Tonawanda, N. Y.; Lillie M. Stahl, administratrix of said Frank E. Stahl, deceased, assignor to Columbus McKinnon Chain Corporation, Tonawanda, N. Y., a corporation of New York.

The method is adapted to manufacture a wire cross chain for anti-skid tire chains. Links are interengaged to form two complete chain assemblies, each being connected to the joiner links at the ends of the cross chain.

✦ ✦ ✦

Patent 2,196,855, PROTECTIVE COATING FOR COPPER WIRES, patented April 9, 1940 by Walter Dietloff, Berlin-Johannisthal, Germany, assignor to General Electric Company, a corporation of N. Y.

More specifically, the coating contains lead, antimony and tin with preferred proportions being 40% to 90% lead, 5% to 15% antimony and remainder tin.

✦ ✦ ✦

Patent 2,197,131, SPRING ASSEMBLY, patented April 16, 1940 by David I. Levine, Lynn, Mass., assignor to Lisson-Melen Co., Lynn, Mass., a corporation of Mass.

The tie wires comprise S-configured loops protruding at spaced regions thereof, one of the hook portions of each the S-configured loop engaging an end convolution of one of the coil springs and the other hook portion of the S-configured loop engaging an end convolution of a juxtaposed coil spring, the end convolutions of the juxtaposed coil springs being in overlapping relationship at their regions thus engaged by the S-configured loop.

✦ ✦ ✦

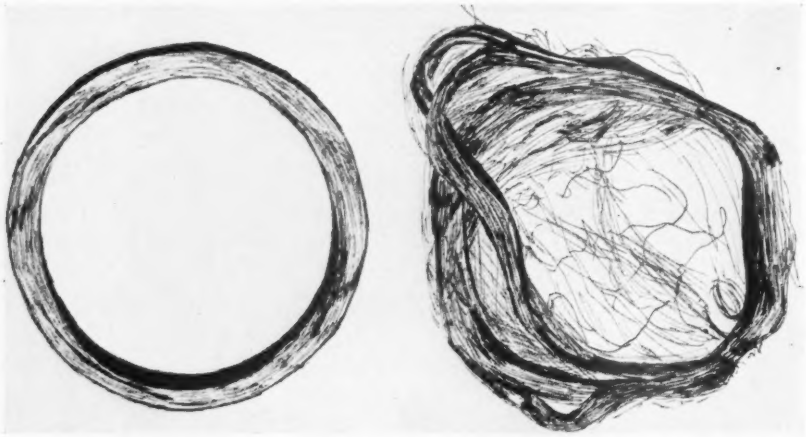
Patent 2,197,180, COILED WIRE HOLDER, patented April 16, 1940 by Kenneth C. Jenne and George F. Manion, Lake Worth, Fla.

This holder comprises two concentric ring members of different diameters held spaced apart by yokes, hinged to one ring member and detachably secured to the other.

✦ ✦ ✦

Patent 2,197,524, WIRE DRAWING FURNACE, patented April 16, 1940 by James H. Green, West Orange, and Henry K. Richardson, Bloomfield, N. J., assignors to Westinghouse Electric &

BELLIS LAVITE FURNACE



Use Bellis LAVITE Furnaces to stop that "Snagging," "Sagging," "Snarling" and "Twisting" of your coils of wire from "bad treatment." LAVITE Furnaces restore full productivity to your plant making possible quicker deliveries for your customers. A few of the many advantages obtained when using LAVITE Furnaces are as follows:

Better Temperature Control • • More Uniform Product
Better Physical Properties • • Less Equipment Investment
New Starting Coils • • Lower Maintenance Cost
Less Floor Space Required • • No Dirt or Smoke

New Water-Cooled Adjustable Electrodes

The Bellis Heat Treating Company

Branford, Connecticut

Manufacturing Company, East Pittsburgh, Pa., a corporation of Pa.

In order to heat wire filaments prior to drawing through the die, these inventors provide a series of closely spaced burners, shielded by semi-circular reflector elements, which partly surround the wire in order to maintain a uniform temperature.

✦ ✦ ✦

Patent 2,197,544, ELECTRIC CABLE, patented April 16, 1940 by Ralph W. Atkinson, Westfield, N. J., assignor to General Cable Corporation, New York, N. Y., a corporation of N. J.

A hollow-core conductor is provided with provision for flow of oil longitudinally of the conductor through a diamond-shaped duct.

✦ ✦ ✦

Patent 2,197,732, THREAD ROLLING DIE AND METHOD, patented April 16, 1940 by Carl G. Olson, Chicago, Ill., assignor to Illinois Tool Works, Chicago, Ill., a corporation of Illinois.

Self-threading screws are provided by this method and die, particularly for rolling threads on fastener blanks, which threads are tapered inwardly toward the axis of the fastener adjacent the entering end.

✦ ✦ ✦

Patent 2,198,589, AUSTENITIC ALLOY STEEL, patented April 30, 1940 by Frederick M. Becket, New York, and Russell Franks, Niagara Falls, N. Y., assignors to Electro Metallurgical Company, a corporation of West Virginia.

This steel contains between 12% and 25% chromium; between 6% and 14% manganese; carbon in an amount not over 0.2%; 0.05% to 0.5% nitrogen; remainder iron.

✦ ✦ ✦

Patent 2,198,625, METHOD FOR THE REMOVAL OF SULPHUR COMPOUNDS FROM IRON, patented April 30, 1940 by Heinrich Koppers, Essen, Germany, assignor to Heinrich Koppers Gesellschaft mit beschrankter Haftung, Essen, Germany.

The process comprises treating the metal in liquid form with sodium and calcium to absorb sulphur with the formation of sodium sulphide and calcium sulphide, the improvement comprising: adding the sodium and calcium to the liquid pig iron as sodium calcium ferrite.

✦ ✦ ✦

Patent 2,198,644, COIL HANDLING DEVICE, patented April 30, 1940 by Frank L. Wettengel, Pittsburgh, Pa.

A coil-stripping electro-magnet is provided, which grips the end of a formed coil and bodily strips it from the coil-forming mandrel, after which the coil is clamped by a tying electro-magnet, and finally received by an electro-magnetically controlled coil receiving and dumping cradle. There are 29 claims.

✦ ✦ ✦

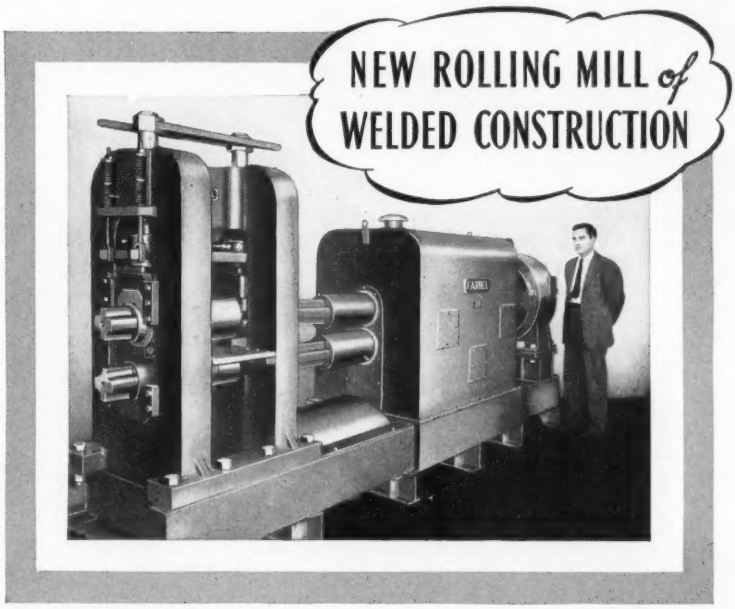
Patent 2,199,061, HANDLING OF ROD BUNDLES OR THE LIKE, patented April 30, 1940 by Richard W. Young and Joseph M. O'Malley, Worcester, Mass., assignors to Morgan Construction Company, Worcester, Mass., a corporation of Mass.

In this assembly a conveyor is arranged to advance the bundles with their axis upright, means effective as each bundle is delivered by the conveyor to swing the front portion of the bundle downwardly and rearwardly while supporting the rear portion thereof from beneath to prevent sagging of the inner convolutions, and a series of hooks arranged to travel past the conveyor and to pass through the bundles from the rear thereof while they are so supported.

✦ ✦ ✦

New Nail Factory in Peru

THE Peruvian firm of Mario Canopa & Company, S. A. (S.I.A.M.), Jiron Lima 638, manufacturers of metal-plated articles, recently announced the establishment of a nail factory. The equipment, consisting of four machines, is reported to have been purchased in the United States. The firm believes it will be in a position to turn out 2,000 tons per year. Operations will be concentrated on nails of 1½, 2, 2½, and 3 inches in length, which are the sizes most in demand in the Peruvian market.



Built by **FARREL** *for Purdue University*

This rolling mill recently built for experimental work at Purdue University embodies some interesting features. It is of welded construction and is designed to perform either hot or cold rolling of metals.

It is an 8″ x 12″ two-high mill with the mill, reduction drive, pinion stand and motor mounted on a common bedplate to form an integral unit. The mill housings, drive case and bedplate are all fabricated from rolled steel plate and welded. Two pairs of interchangeable forged steel rolls are furnished, one pair of suitable composition and hardness for cold rolling and the other pair for hot rolling. The housings are of the arch-top type, welded together into a single structure.

On each housing, mounted between the top roll rider and adjusting screw, is a hydraulic cylinder or pressure block with a ram. The total separating force on each screw is recorded in pounds on a chart, and adding the separate readings gives the total separating force on the mill.

The mill is driven by a direct current, variable speed motor through an enclosed double reduction drive with integral pinion stand. The drive is the vertical type with all gear centers in the same plane. Gears and mill pinions are accurately generated Sykes continuous tooth herringbone and are mounted in anti-friction roller bearings. An oil pump with filter provides force-feed lubrication to all gears and bearings.

When you have a problem involving the rolling of metals take advantage of the experienced counsel and expert assistance Farrel engineers can give you. We are prepared to build mills of any size for rolling all kinds of non-ferrous metals and cold rolled strip steel.

FARREL

FARREL-BIRMINGHAM COMPANY, Inc.
ANSONIA, CONN.
New York • Buffalo • Pittsburgh • Akron • Chicago • Los Angeles

'Round the World With the Wire Industry

THE European situation has, of course, been greatly affected by the events in Scandinavia, although this means but little for the wire and wire products markets. Sweden exports about 2-300 tons of low carbon steel wire rods to Great Britain and these are under control now of Germany, but the far greater importance is, of course, the export of Swedish steel to the Allies also now controlled by Germany.

✦ ✦ ✦

ON the general wire export market, Overseas business has not been very important, with exception of wire nails, for which all Belgian mills are working at maximum capacity. The European demand on all markets has been very satisfactory. It is a matter of curiosity not only in the U. S. A. but also in Europe, that the main war product on the wire market, ie., barbed wire, sells slowly. As a matter of fact orders are scarce and when American January and February barbed wire exports were only slightly above 1939 in contrast to nails, galvanized wire, etc., in Europe exports were even smaller than those of 1940.

✦ ✦ ✦

NO change in export prices, which as a whole were slightly lower and some concessions were given but not for wire rods. Wire rods are very firm and the scarcity continues. Germany is shipping now as before to neighboring countries, but of course nothing to Oversea. Italy gets about 1200 tons of German wire rods now and Switzerland 3-400, Holland almost nothing, Denmark 6-700, etc. It is remarkable that German wire rods are reported to be exported above the average first quarter 1939, probably about 1000 tons a month, whereas exports of wire products declined. This is due to the fact that wire products were sent in far greater quantities to Overseas markets than steel. The decline of steel exports compared with last year is about 32% but of wire products between 45 and 50%. Wire remains rationed in Germany, but the industry has sufficient raw material and the production as among the various works is still at about 100,000 tons a month, of which some 11,000 to 12,000 tons in all are sent for export directly and 5,000 to 6,000 tons indirectly.

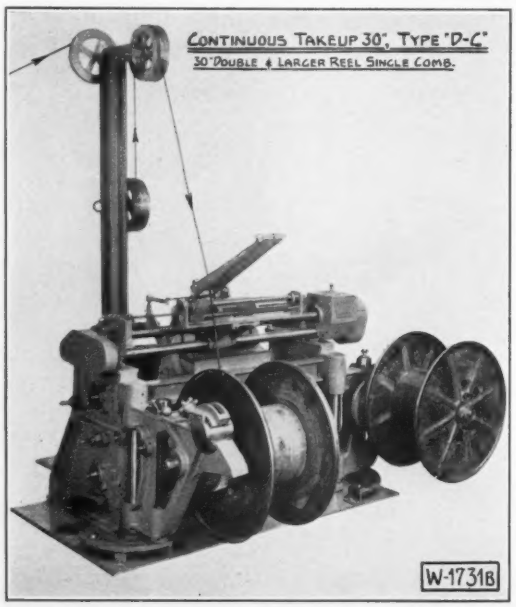
✦ ✦ ✦

ITALY and all Balkan countries have rationing of wire and its use is prohibited for many purposes. It is of very great interest that the bulk of German export sales in Marks on clearing basis (now about 95% of all transactions) is at prices unaltered compared with the September 1939 prices. Domestic prices are also unaltered without exception. This means, that present German ex-

THE WATSON MACHINE COMPANY

ESTABLISHED 1845

PATERSON, NEW JERSEY, U. S. A.



Reels Shown in Running & Unloading Positions

Continuous Takeups Type D. C.

Designed for continuous constant-tension reeling of product as delivered to takeup by processing equipment. Commonly employed in Continuous Vulcanizing or Tubing process. Speed variation by hydraulic control synchronizes reeling speed to capstan haul rate. Transfer of product from full to empty reel occurs at full speed. Removal of filled reel and replacement by empty reel is rapidly accomplished. Rugged construction with anti-friction bearings throughout.

port prices are considerably below the f.o.b. Anvers quotations in dollars, the difference is up to 15%. Whereas last year German Reichsmarks quotations for clearing countries were about pound sterling prices. On the other hand many raw materials for export to Germany from the clearing countries are also unaltered, which explains the steady price in Germany.

✦ ✦ ✦

Sweden Refuses Iron and Steel Export Permits

THE Swedish State Trade Board has cancelled some previously granted export licenses and is refusing to issue future licenses to export iron and steel products which are considered as essential to home needs during the emergency. However, the prohibition does not include iron ore.

✦ ✦ ✦

British Imports of Iron Ore and Scrap

THE following figures received from the Office of the American Commercial Attache at London show the imports into Great Britain of iron ore, scrap and steel manufactured from these products for January 1940 compared with January 1939.

	Jan. 1939	Jan. 1940
Iron ore and scrap	£ 393,022	£ 903,832
Iron and steel and manufactures thereof	£ 855,373	£ 1,918,497

✦ ✦ ✦

British Steel Demand

WAR supplies and shipbuilding are taking the bulk of the steel now manufactured. Some idea of the demand may be had from the prohibition recently placed on the supply of such a small item as florists' wire, including that used by artificial flower manufacturers. This industry used annually some 1,200 tons.

✦ ✦ ✦

Attendance List

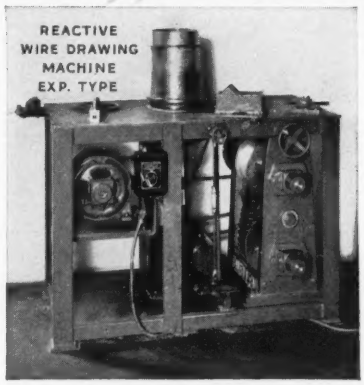
(Continued from Page 323)

SEE, WALTER GEORGE, Sales & Service Mgr., Submerged Combustion Co. of America, Hammond, Indiana.
SELLS, L. G., Foreman Wire Drawing Dept., American Steel & Wire Company, Braddock, Pa.
SEYMOUR, H. W., Works Mgr., Page Steel & Wire Div., American Chain & Cable Co., Monessen, Pa.
SHEARER, R. G., Clerk, Jones & Laughland Steel Corp., Pittsburgh, Pa.
SIEBERT, JOHN C., Metallurgist, Bethlehem Steel Company, Johnstown, Pa.
SKEKEL, ALEX, Supt. Wire & Wire Products, Pittsburgh Steel Company, Pittsburgh, Pa.
SMITH, H. H., District Metallurgist, American Steel & Wire Co., Pittsburgh, Pa.
SMITH, T. R., Sales Repr., Oakite Products Co., Inc., Pittsburgh, Pa.
SMITH, VAN DORN C., Sales Dept., Oakite Products Co., Inc., New York, N. Y.
SOLGER, W. H., Sales Engineer, Aetna-Standard Engineering Co., Youngstown, Ohio.
SPITTAL, CHAS. W., Gen. Supt., Allegheny-Ludlum Steel Corp., Dunkirk, N. Y.
STEELE, ROBERT J., Ch. Engr., Firth-Sterling Steel Co., McKeesport, Pa.
STEVICK, R. S., Works Mgr., Firth-Sterling Steel Co., McKeesport, Pa.
STROHM, S. H., Sales Clerk, Jones & Laughlin Steel Corp., Pittsburgh, Pa.
SULLIVAN, F. L., Treasurer, Grief Bros. Cooperage Co., Cleveland, Ohio.
SULLIVAN, J. J., Wire Research, Universal Cyclops Steel Corp., Bridgeville, Pa.
TARBY, S. E., Foreman, Tungsten Carbide Die Dept., American Steel & Wire Co., Braddock, Pa.
THOMPSON, J. R., Asst. Mgr. Met. Dept., American Steel & Wire Co., Cleveland, Ohio.
THOMPSON, W. PAUL, Metallurgist, Townsend Company, Fallston, Pa.
TITUS, RAY, Asst. Supt., Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
VAN ORMER, L., Asst. Metallurgist, Jones & Laughlin Steel Corp., Aliquippa, Pa.
VAUGHN, L. A., President, Vaughn Machinery Company, Cuyahoga Falls, Ohio.
WATKINS, STANLEY P., Mgr., Sales Devl., Rustless Iron & Steel Corp., Baltimore, Maryland.
WEIDNER, H. C., JR., Townsend Company, New Brighton, Pa.
WEISER, P. W., Dist. Mgr., Carboloy Company, Inc., Pittsburgh, Pa.
WELCH, ELMER B., Chief Chemist, Firth-Sterling Steel Co., McKeesport, Pa.
WELSH, J. ALAN, Sales Engr., Firth-Sterling Steel Co., McKeesport, Pa.
WESTPHAL, F. A., Supt. Wire Mill, Sheffield Steel Corp., Kansas City, Mo.
WHITTEN, J. L., Sales Manager, Lee Wilson Engineering Co., Cleveland, Ohio.
WILEY, WM. G., Asst. to Gen. Mgr. Sales, General Cable Corporation, New York, N. Y.
WINKLER, L. H., Metallurgical Engr., Bethlehem Steel Company, Bethlehem, Pa.
WINSTEL, J. P., Dist. Industrial Engr., American Steel & Wire Co., Pittsburgh, Pa.
WOLFE, WILLIAM L., Sales Dept. Clerk, Jones & Laughlin Steel Corp., Pittsburgh, Pa.
WOODSIDE, ROBERT A., Asst. Plant Met., American Steel & Wire Co., Donora, Pa.
YOUNGEN, H. C., Sales, Pittsburgh Steel Co., Pittsburgh, Pa.

SINGLE HOLE AND CONTINUOUS PRODUCTION MACHINES

MORE WIRE and BETTER WIRE---At Less Cost

Less Power Per Ton — Lower Die Costs



More Production — Lower Costs Per Ton

(Manufactured and sold under Smith-Stringfellow Patents)

ADDRESS

REACTIVE WIRE DRAWING

Room #36, Central Exchange Bldg., Worcester, Mass.

If You Are Not A Member Of The Wire Association — Now Is A Good Time To Join!

The Annual Dues Are $10.00

For detailed information address

RICHARD E. BROWN, Secretary

THE WIRE ASSOCIATION

300 Main St., Stamford, Conn.

Getting Salesmen's Co-operation

Tying in Advertising with Selling

Getting out into the field

Copy Testing

DIRECT MAIL

Layout, Copy and Illustration

Market Information

contributing to the solution of general company problems

Readership of Publications

Measuring Results

ALLOCATION OF BUDGETS

Programs that management will approve

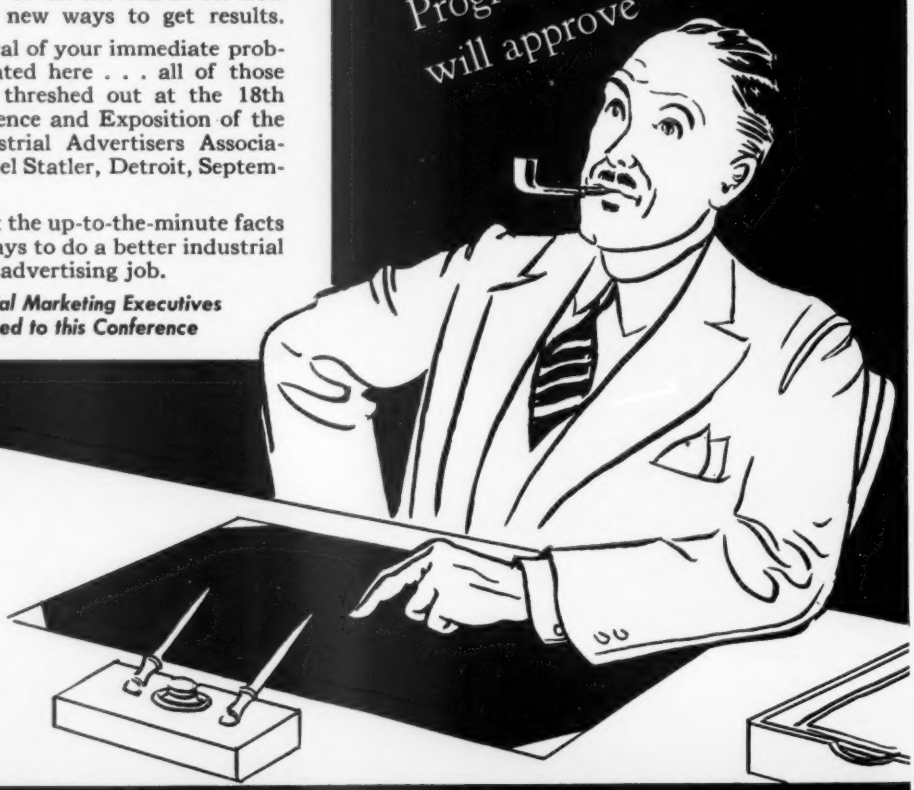
WHAT'S YOUR PROBLEM?

Your business . . . in at least one respect . . . is no different from others: *Your marketing problems are constantly changing.* You must ever be on the search for new ideas . . . for new ways to get results.

No doubt several of your immediate problems are indicated here . . . all of those shown will be threshed out at the 18th Annual Conference and Exposition of the National Industrial Advertisers Association, at the Hotel Statler, Detroit, September 18, 19, 20.

Plan now to get the up-to-the-minute facts on the latest ways to do a better industrial marketing and advertising job.

All Industrial Marketing Executives are Invited to this Conference



NIAA
NATIONAL INDUSTRIAL ADVERTISERS ASS'N

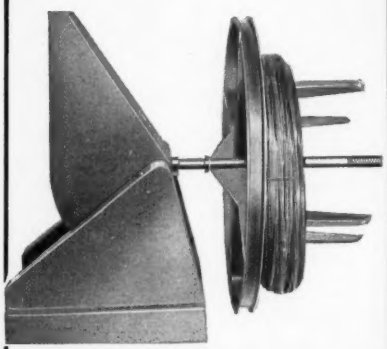
1940 INDUSTRIAL ADVERTISING CONFERENCE

DETROIT . . . HOTEL STATLER . . . SEPTEMBER 18, 19, 20

THE "SHIFTWEIGHT" TILTING WIRE REEL

A counter-balanced tilting wire reel with full 42" diameter upper guard rings, allowing perfect feeding of wire off the coil and absolutely "Snarl Proof."

No Levers — Locking Mechanism Controlled Through Shaft. One man can handle up to 300 pound coils as with this "Shiftweight" design both hands and feet of the operator are free.



Weight so distributed that reel need not be bolted to floor.

Moslo Machinery Inc.

5005 Euclid Ave.

Cleveland Ohio

Wire Reels Rod Bakers
Spot Welders Roll Straighteners
Wire Straightening and Cutting
✦ ✦ ✦ Machines ✦ ✦ ✦

The "Braidex" High Duty Covering Machine for Telephone, Flexible and Other Cable

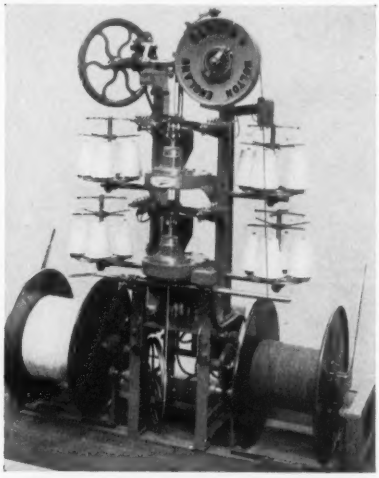
CARTER'S **"Braidex"** machine has been developed and designed so as to put two distinct knitting tubular envelopes or sheathes over electric conducting wire.

✦ ✦ ✦

THE approximate production of this machine is 720 feet per hour at 14 stitches per inch, using 40's single ends, cotton yarn when covering 3/029's vulcanized India Rubber Cable.

✦ ✦ ✦

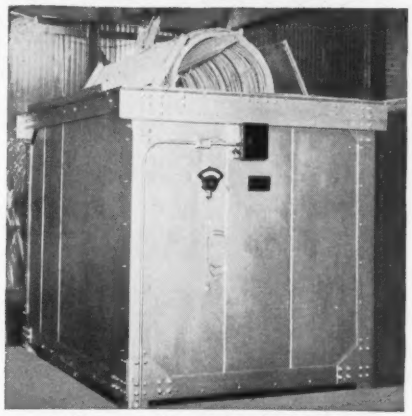
ABOUT the largest size of cable produced on this machine is 7/036's, the outside diameter of this cable being .202".



THE heads arranged co-axially, one immediately over the other, the core passes through one head and then immediately through the other. The inner envelope is knitted by the upper head which rotates in a clockwise direction, whilst the outer envelope is knitted by the lower head, which rotates in an anti-clockwise direction. The cams and creel holders are stationary. Owing to the special design of the knittingheads, the tension on the yarn being knitted can be varied as the machine is running, to such a degree that the sheath or cover is made very tight on the core. This is an important feature as this sheath or cover should not slip back on the conductor or core when being threaded through the conduits.

(*Please turn to Page 332*)

Cut ROD BAKING TIME AND COST... with CARL-MAYER HI-SPEED TRADE MARK Rod Baker



Carl-Mayer Indirect Hi-Speed Rod Baker in Prominent Steel Company of Canada]

These production figures should interest you!

Carl-Mayer HI-SPEED Indirect Pit Type Rod Baker . . . . Baker Temperature, 500°F. . . . . Load per Pin, 2100 lbs.

LOW CARBON .15 - .20	HI-CARBON .4 - .7
7 Minutes per pin	9 Minutes per pin
7 " " "	10 " " "
6 " " "	11 " " "
8 " " "	10 " " "
6 " " "	9 " " "

FUEL REDUCTION 25% TO 35% OVER PREVIOUS PERFORMANCES

Inspect above installation . . . Check results yourself . . . Company name on request.

CARL-MAYER PATENTED BLOW-OFF FEATURE removes moisture without rolling, bumping or agitating the coils . . . Write for complete data.

OVER 20 YEARS EXPERIENCE

THE CARL-MAYER CORPORATION
3030 EUCLID AVE.
CLEVELAND, O.

Write for INFORMATION

RODINE, in the pickling bath, saves acid and metal, minimizes brittleness, lowers pickling costs.

RODINE more than pays its way.

CUPRODINE creates a bright, tight, uniform copper coating in a minimum of time. It is used in a simple immersion process, without current.

Bulletins on request.

American Chemical Paint Co.

Dept. 306, AMBLER, PENNA.

Detroit, Mich. Walkerville, Ont.

GET COMPLETE LUBRICATION WITH NOPCO 2261

Nopco 2261 is a new departure in tube drawing compounds. Its extremely high neutral fat content—50%, insures correct and adequate lubrication, even in cases where heavy draws with large reductions are made.

Nopco 2261 is highly versatile, being equally effective in the wet drawing of:

Any size copper or brass tubes.

Large copper or brass shells, rivets, etc.

Heavy copper or brass wire.

Nopco 2261 is a superior lubricant. It is formulated of high titre vegetable fats—is readily soluble. It may be depended on to aid production and to effect economies in your drawing operations.

Write for Technical Data Bulletin, or better still, order enough for a trial—see for yourself.

REG. U. S. NOPCO PAT. OFF.

NATIONAL OIL PRODUCTS CO.

HARRISON, N. J.

BOSTON • CEDARTOWN, GA. • CHICAGO • SAN FRANCISCO

The Braidex Covering Machine

(*Continued from Page 331*)

TO form a knitted sheath, the wales or stitches are spirally disposed around the conducting wire or core, instead of being straight, this provides an improved form of flexible cord-like body with knitted tubular envelopes, of such construction that neither bending of the body causes rupture of the envelope, nor twisting of the body causes damage to the envelope, either before or after compounding.

✦ ✦ ✦

THE machine is arranged with stationary cotton supply creels for holding conical packages 5" diameter x 6" traverse, weighing about 15 ozs. each. There are sixteen of these generally used on the machine, wound single end of cotton yarn, the total yardage being 547,600 yards. For example, when covering V.I.R. c/029's at 14. stitches per inch, the creel holds sufficient cotton to run the machine for approximately 23 hours and yarn breakages are almost unknown.

✦ ✦ ✦

THE machine is self-contained unit driven by electric motor and operated by push-button controls from front and back. Fitted with electrical automatic controls, so that if an end breaks, yarn supply, conductor or core runs out, or through loose stitching, the machine stops almost instantaneously without any over-running there being no apparent visible evidence to show a piecing-up. The Pay-out and Take-up Stands are arranged for maximum size of drums or reels of 24" diameter x 12" between flanges, these stands are arranged with easy lifting and lowering device and fitted with traverse motion for traversing the cable, variable for length of traverse and law of wind.

✦ ✦ ✦

THE advantages claimed for this machine are:—

(A) Production, which is considerably faster than Braiding.

(B) Little or no attention, a large number of machines can be looked after by a female operator.

More Tonnage per Pound!

You can get a much higher tonnage of steel wire per pound of lubricant, insure longer die life and maintain better finish, with

MAGNUS WIRE DRAWING COMPOUNDS

Specially formulated to meet the definite conditions of wire size, type of drawing operations and other factors you face in your mill. There's a Magnus lubricant to suit your problems exactly on both wet and dry drawing operations.

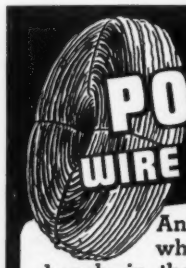
GET THIS PERFORMANCE DATA

Ask for your set of reports covering performance of Magnus Wire Drawing Lubricants on all kinds and types of wire.

MAGNUS CHEMICAL CO.

188 South Ave., Garwood, N. J.

MAGNUS CLEANERS



PORTER WIRE CUTTERS

Any wire, anywhere — on the bench, in the wreckage, on the pole or on the ground — hard wire, stranded wire, insulated wire — a Porter tool will cut it easily and quickly.

ASK FOR CATALOG

of Porter Cutting Tools — see Bench Cutter for shop use. See Electric Wire Cutters with insulated handles. See Cable Cutter for ¾" soft rope or ⅝" hard rope. See the entire Porter line of precision built portable cutting tools with valuable information about tool selection and use.

H. K. PORTER, Inc.
Everett Mass.

(C) **Yarn is cheaper, it can be purchased in large conical packages, thus showing a saving of winding.**

(D) **Small amount of Floor Space required, as these machines can be installed back to back.**

✦ ✦ ✦

THIS machine is manufactured by B. & F. Carter & Company, Ltd., Albion Works, Waterloo Street, Bolton, England, who will be glad to supply definite data, as to specific production problems, to anyone writing with reference to that machine.

✦ ✦ ✦

Surface Impregnation of Lubricant In Wire

A POSSIBILITY of producing wire with a surface-impregnation of dry lubricant for use in such applications where lubricant will prevent binding, sticking, and wear, is forecast as the result of a recent discovery, according to Acheson Colloids Corporation, Port Huron, Mich.

✦ ✦ ✦

IN attempting to apply the same principle of drawing-die lubrication in stainless steel wire, however, it was discovered that the graphitic coating could not be removed by normal methods such as washing. Investigation disclosed that the movement of the wire through the drawing dies and the pressures involved in its passage through the dies had created what is known as a "graphoid" surface on the wire. That is, the extremely fine colloidal graphite particles had been intimately combined with the metal in the surface of the wire.

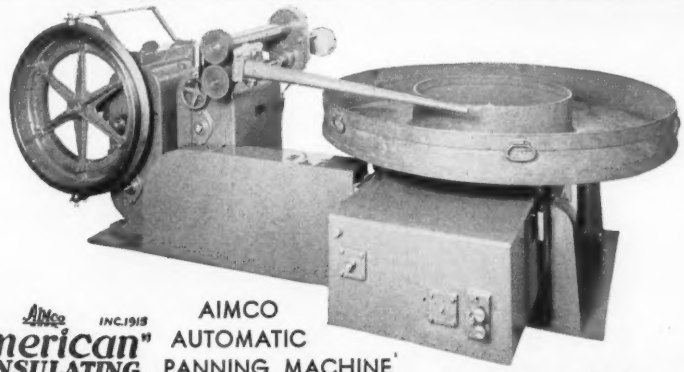
✦ ✦ ✦

Organizing Company to Operate Copper Wire Mill at Dollar Bay

A COMPANY is being organized headed by Frank W. Foley, veteran wire manufacturer, to take over and operate the Roebling copper wire mill at Dollar Bay, Mich., which has been idle for the past three years. Operations are expected to get under way within 90 days, with a payroll of about 50 men. Copper rods and wire will be produced with both lake and electrolytic copper being used. Mr. Foley will have charge of the mill's operations.

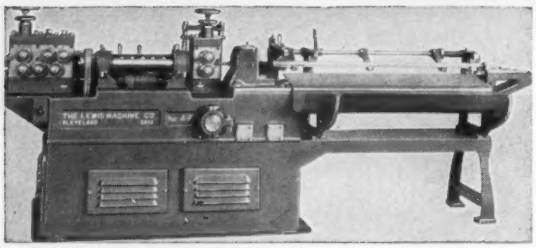
"STANDARD WIRE DRAW"
FOR HIGH-LOW CARBON, BRIGHT, COLD HEADING
WET WIRE DRAWING
● Lower die costs ● Better finished wire
● Lubricants specially adapted for drawing on high speed machines
EXPERIENCED SERVICE MEN WILL DEMONSTRATE THE MERIT OF OUR PRODUCTS
STANDARD INDUSTRIAL COMPOUNDS CO.
4600 Ferdinand St. Chicago, Ill.

Learn about PARALAN
Paralan will give your finished wire and wire products protection from atmospheric corrosion in the mill and in shipping. Paralan-coated wire can be spot welded or soldered without cleaning. Also, Paralan leaves surfaces in good condition for all types of finishes—enameling, japanning, lacquering, plating, etc.
Write for further information. We may be able to solve your difficulties.
AMERICAN LANOLIN CORP.
LAWRENCE, MASSACHUSETTS


EST. 1855 AIMCO INC. 1913
"American" INSULATING MACHINERY COMPANY
AIMCO AUTOMATIC PANNING MACHINE
For Rubber Covered Wire Ball Bearing
517 West Huntingdon St.
PHILADELPHIA PENNSYLVANIA U.S.A.

WIRE BRAIDING MACHINES
SINGLE, DOUBLE OR TRIPLE DECK
VERTICAL OR HORIZONTAL TYPE
Designed and constructed to insure an efficient and profitable output.
Write for complete information today.
NEW ENGLAND BUTT COMPANY
Dept. W-6, Providence, R. I.
CHICAGO OFFICE—20 NORTH WACKER DRIVE

LEWIS TRAVEL-CUT WIRE STRAIGHTENING and CUTTING Machines



Machines for 1/16" to 3/4" rod

Round
Square
Flat
Hexagon

Ferrous and Non-Ferrous

Automatic
High Speed
Heavy Duty

The Sign of Dependable Service:

WE CAN SUPPLY AND ENGINEER OUR TOOLS EQUIPPED WITH CARBOLOY CEMENTED CARBIDE

THE LEWIS MACHINE CO., 3445 E. 76 St., Cleveland, Ohio

WIRE NAIL MACHINERY

These machines are made in eleven different sizes. This enables us to cover any size of nail most efficiently.

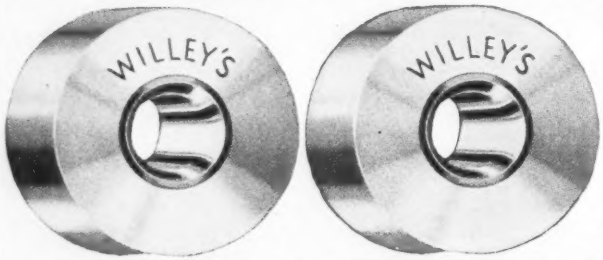
GLADER Nail making machines have been adopted as standard equipment in all recent major nail mill installations.

For further information, prices, etc., write to us.

Wm. Glader Machine Works

210 N. RACINE AVENUE, CHICAGO, ILL.

ALL EYES ON WILLEY'S DIES



WRITE FOR CIRCULAR EXPLAINING WHY!

Sales engineers in principal cities.

WILLEY'S CARBIDE TOOL CO.

1340 W. VERNOR HIGHWAY DETROIT, MICHIGAN

The Iron and Steel Institute of Great Britain

THE Council of the Iron and Steel Institute have much pleasure in making known the following information:

NEW President, 1940—Mr. John Craig, C. B. E., Chairman and Managing Director of Messrs. Colvilles, Limited, has been elected President of the Institute for the next two years. Mr. Craig will be inducted into the Presidential Chair by the Retiring President, The Right Hon. The Earl of Dudley, M. C., at the Annual General Meeting on Thursday, May 2nd, 1940.

✦ ✦ ✦

BESSEMER Gold Medal, 1940—The Bessemer Gold Medal for 1940 has been awarded to Dr. Andrew McCance, of Glasgow, in recognition of his eminent services in connection with the application of science to the Iron and Steel Industry. Dr. McCance is a Director and General Manager of Messrs. Colvilles, Limited. The presentation will be made at the Annual General Meeting on May 2nd.

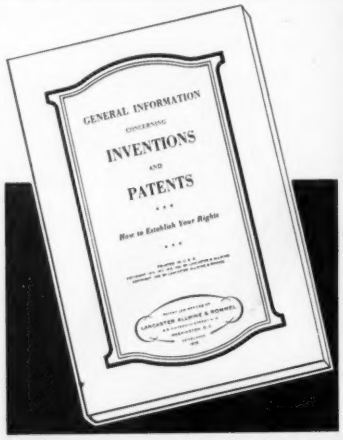
HONORARY Member — Monsieur Eugène Schneider, D. Sc., has been nominated an Honorary Member to celebrate the fiftieth anniversary of his election to membership. Monsieur Schneider joined the Institute in 1890, he became a Member of Council in 1905 and was President for the period 1918-1920. In 1930, the Bessemer Gold Medal was awarded to him. Had it not been for the outbreak of war, the Autumn Meeting of the Institute this year would have taken place in France, and Monsieur Schneider took a leading part in the preliminary discussions of the arrangements.

✦ ✦ ✦

VICE-President.—Mr. Fred Clements, Managing Director of the Park Gate Iron and Steel Company, Limited, and a Member of Council, has been nominated a Vice-President.

✦ ✦ ✦

ANDREW CARNEGIE Silver Medal for 1939.—The Council have decided to award an Andrew Carnegie Silver Medal to Mr.



Send for a copy - it's free.

Interesting Booklet concerning Inventions, Patents, Trade-Marks and Copyrights, together with Schedule of Government and Attorney's fees, sent free on request. Simply ask for "booklet and fee schedule."

No charges are made for preliminary advice, either in connection with patent, trade-mark or copyright cases.

Lancaster, Allwine & Rommel

Registered Patent & Trade-Mark Attorneys

438 Bowen Bldg., Washington, D. C.

Hy-Carbo Steel Co.
Est. 1917
✦ ✦ ✦
HIGH GRADE CUSTOM WIRE DRAWING
Less Ton Lots A Specialty
✦ ✦ ✦
LOWELL, MASS.

Continuous Straightening and Cutting Machinery
With
FLYING SHEAR
for round and shaped wire.
✦ ✦ ✦
THE HALLDEN MACHINE COMPANY
THOMASTON CONNECTICUT

UNIVERSAL WIRE REEL
Quickly and easily adjusted to any angle within 90 degrees. Cut shows one angle.
Write for circular R
THE F. B. SHUSTER CO.
New Haven, Conn.
Straightener Specialists Since 1866

Wire Drawing Diamond Dies
COCHAUD
WIRE DIE CORPORATION
300 W. 56th St., NEW YORK
Tel. Col. 5-1340

Bo W. L. Ljunggren for his memoir entitled "Method of Sclero-grating Employed for the Study of Grain Boundaries and of Nitrided Cases; Grain Structures Revealed by Cutting," in which he described the results of an investigation carried out with the aid of a grant from the Andrew Carnegie Research Fund.

✦ ✦ ✦

WILLIAMS PRIZE, 1939. — The Council have decided that the Williams Prize for 1939 shall be divided between Mr. W. B. Lawrie for his paper on "The Refining of Metal in the Basic Open-Hearth Furnace. The Influence of Fluorspar on the Process," and Mr. W. T. Wilson for his paper on "The Rolling of Sections at the Appleby-Frodingham Steel Company, Limited." These papers were printed in the No. I volume of the **Journal of the Iron and Steel Institute** for 1939, pp. 257P and 321P, respectively. The awards will be made at the Annual General Meeting.

✦ ✦ ✦

ABLETT PRIZE, 1940.—No papers have been received in competition for the Ablett Prize for a paper on a subject connected with engineering in Iron and Steel Works written by a junior engineer.

✦ ✦ ✦

THE Council have accepted an offer from Captain Ablett to renew the Prize for competition in 1941. The conditions governing this competition can be learned on application to the Secretary of the Institute. Competing papers should be submitted as soon as possible and in any case not later than January 31st, 1941.

APCO MOSSBERG CO.
the original Frank Mossberg Co.
Manufacturers of Reels and Spools
Attleboro, Mass.

CLEVELAND TRAMRAIL
Division of
THE CLEVELAND CRANE & ENGINEERING CO.
WICKLIFFE, OHIO
Leading manufacturers of
OVERHEAD MATERIALS HANDLING EQUIPMENT
for the Wire and Wire Products Industry

GEORGE D. HARTLEY
CONSULTANT
ON
SPRING MAKING
AND
WIRE WORKING
MACHINES & METHODS
311 MAIN ST.
WORCESTER, MASS.

KENNETH B. LEWIS
CONSULTING ENGINEER
Wire Mill Equipment, Layout and Practice
43 Midland St., Worcester, Mass.
Phone: Worcester 5-6033

WIRE MACHINERY SPECIALISTS
3—Nilson No. 1, 3 & 4 4 Slide Wire Machines
2—Baird No. 3 & S3F 4 Slide Wire Machines
7—Waterbury Step Cone Wire Drawing Machines
1—Two Spindle Bull Block Motor Driven
6—Lewis Welding Wire S & C Machines M. D.
2—Shuster Shaped Wire S & C Machines ½" & ⅞"
8—Shuster Round Wire S & C Machines 1/32"-½"
Wanted: Tack Making Machinery. All Sizes.
NATIONAL MACHINERY EXCHANGE
128-138 MOTT ST. NEW YORK, N. Y.

WANTED TO BUY
WIRE NETTING MACHINES
and auxiliary machines for hexagon netting. Reply to Box No. 319, %
WIRE & WIRE PRODUCTS

Largest Stocks in U. S. A.
VIANNEY
Famous Wire Drawing Diamond Dies
250 E. 43rd St., New York

ZINC WIRE
THE PLATT BROS. & CO.
WATERBURY, CONN.

Designers and Builders of Gas-Fired Heat Treating Furnaces for Ferrous and Non-Ferrous Wire.
SURFACE COMBUSTION CORPORATION
Main Plant and General Offices—Toledo, Ohio

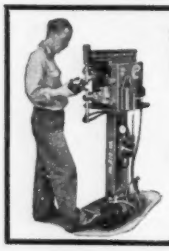
RUESCH
Machinery For
Wire, Tube, and Brass Mills
409 Mulberry St., Newark, N. J.

DIAMOND CARBIDE
DIES
KELLY
WIRE DIE CORPORATION
19 W. 34th St. New York

WIRE DRAWING MACHINERY
AND EQUIPMENT
Rod Frames — 16" Frames, 8" Frames — Take-Up Frames, Wire Pointers — Puller Tongs.
General Castings for Wire Mill use.
Circulars on Request.
E. J. SCUDDER FOUNDRY & MACHINE CO.
TRENTON, N. J.

FOR DIAMOND AND CARBIDE WIRE DRAWING DIES SEE
RUSCH WIRE DIE CORPORATION
275 Seventh Ave., New York, N. Y.

BRODEN
Wire Mill and Cold Rolling Equipment
Broden Construction Co.
11730 Harvard Ave.
CLEVELAND, OHIO



We manufacture Electric Spot Welders from ¼ to 500 K.V.A. We also make standard and special Transformers of all kinds. A.C. Arc Welders from 100 to 400 Amps.
Eisler Engineering Co.
CHAS. EISLER, Pres.
764 So. 13th St.
(Near Avon Ave.)
Newark, New Jersey

1940 National Metal Exposition

THE 1940 National Metal Congress and Exposition scheduled for Public Auditorium, Cleveland, Ohio, the week of October 21 has already exceeded in space reservations the entire floor space occupied at the Chicago Show last year. This is most unusual inasmuch as it represents the largest advance space reservation in the history of the Society's twenty-two expositions.

✦ ✦ ✦

ON February 19 a floor plan and reservation blank were forwarded to all previous exhibitors and they were requested to indicate to headquarters their choice of location, and were informed that spaces would be assigned by the committee as soon as possible after April 6.

✦ ✦ ✦

RESERVATIONS began to arrive immediately, and on the closing date requests had been received for over 86,000 square feet of space. This amount is in excess of the total amount sold at the Chicago Show last year, and a greater amount of space than was provided for in the layout of the Cleveland Auditorium.

✦ ✦ ✦

CONSEQUENTLY it is impossible for the committee to assign space at this time as it will be necessary to lay out additional exhibit space in the Auditorium and then permit all previous exhibitors to have an opportunity to make new selections (if they so desire) including the newly laid out space.

✦ ✦ ✦

THERE will be plenty of show space available in the Public Auditorium—up to 150,000 square feet—but the amount of space laid out was in accordance with the size of previous expositions. It is interesting to surmise why such enthusiastic responses have taken place—first, the increased confidence of business in the future outlook, and secondly, the continued recognition of the National Metal Exposition as the outstanding metal merchandising activity of the year.

ROYLE
PATERSON N J
BUILDING EXTRUDERS SINCE 1880
Pioneer builders of tubing and rubber covering machinery
JOHN ROYLE & SONS
PATERSON, N. J.
British Agency: James Day (Machinery) Ltd., Sentinel House, Southampton Row, London, W. C. 1, England

MANUFACTURERS OF
WIRE BRAIDING — SPOOLING — TAPING
WINDING AND SPECIAL MACHINES
SINFRA WIRE COVERING MACHINES
FIDELITY MACHINE CO.
3908-18 Frankford Ave., Phila., Pa.

SPARK - TESTING EQUIPMENT FOR
INSULATED WIRE AND RUBBER HOSE
JAMES L. ENTWISTLE
43 CHURCH ST. PAWTUCKET, R. I.

TANKS
FOR EVERY MILL OPERATION
CLEANING—PICKLING—PLATING.
LEAD LINING RUBBER LINING
THE HAUSER-STANDER TANK CO.
CINCINNATI, OHIO

MOSSBERG
PRESSED STEEL CORP.
ATTLEBORO, MASS.
STEEL REELS AND SPOOLS

WIRE, WIRE ROPE AND ELECTRIC CABLE MACHINERY
THOMSON-JUDD
WIRE MACHINERY COMPANY
SUBSIDIARY OF
THOMSON-GIBB ELECTRIC WELDING COMPANY
LYNN, MASSACHUSETTS
WRITE FOR CATALOGUE

Wire Drawing and Extrusion Dies made of
DIAMONDS, COMPOSITION, etc.
F. KRAUSE & COMPANY, INC.
250 Ogden Ave. Jersey City, N. J.
Phone JOurnal Square 4-5105

Make your plans now to attend The Annual Wire Association Convention, Cleveland, O., Oct. 21-25, 1940.

Index to Advertisers

A

American Chemical Paint Co. 332
American Insulating Machinery Co. 333
American Lanolin Co. 333
Apco-Mossberg Co. 335

B

Bellis Heat Treating Co. 326
Bethlehem Steel Corp. 290
Broden Construction Co. 336

C

Carl-Mayer Corp., The 331
Carboloy Company, Inc. 289
Cleveland Tramrail Div. of Cleveland Crane & Eng. Co. 335
Cochaud Wire Die Corp. 335

D

Drever Co. ..... Inside Front Cover

E

Eisler Engineering Co., Inc. 336
Electric Furnace Co., The ..... Back Cover
Entwistle, Jas. L. 336

F

Farrel Birmingham Co., Inc. 327
Fidelity Machine Co. 336
Firth-Sterling Steel Co. 300

G

Glader, Wm., Machine Works 334

H

Hallden Machine Co., The 335
Hartley, Geo. D. 335
Hauser-Stander Tank Co., The 336
Hudson Wire Company ..... Inside Back Cover
Hy-Carbo Steel Co. 335

J

Jones & Laughlin Steel Corp. ..... Front Cover

K

Kelly Wire Die Corp. 336
Keystone Steel & Wire Co. 323
Krause, F. & Co., Inc. 336

L

Lancaster, Allwine & Rommel 334
Lewis, K. B. 335
Lewis Machine Co., The 334

M

Magnus Chemical Co. 332
Micro Products Corp. 321
Morgan Construction Co. 298
Moslo Machinery, Inc. 331
Mossberg Pressed Steel Corp. 336

N

National Machinery Exchange 335
National Oil Products Co. 332
National Rubber Machinery Co. 314-315
New England Butt Co. 333
Norton Company 295

P

Pittsburgh Steel Co. 294
Platt Brothers & Co. 336
Porter, H. K., Co. 332

R

Reactive Wire Drawing 329
Robertson, John, Co., Inc. 324
Ross Engineering Corp., J. O. Division of Ross Industries Corp. 322
Royle, John, & Sons 336
Ruesch Machine Co., H. J. 336
Rusch Wire Die Corp. 336

S

Scott, H. L., Co. 311
Scudder Foundry & Machine Co., E. J. 336
Shuster, F. B., Co., The 335
Sleeper & Hartley, Inc. 308
Standard Industrial Compounds Co. 333
Standard Machinery Co. 296
Stevens Metal Products Co. 299
Surface Combustion Corp. 336
Syncro Machine Co. 325

T

Thomson-Judd Wire Machinery Co. 336
Torrington Manufacturing Co., The 291

V

Vascoloy-Ramet Corp. 293
Vaughn Machinery Co., The 297
Vianney Wire Die Works 335

W

Waterbury Farrel Fdy. & Machine Co., The 292
Watson Machine Co., The 328
Willey's Carbide Tool Co. 334

THE ANNUAL MEDAL AWARD

OF THE

WIRE ASSOCIATION

FOR THE MOST MERITORIOUS PAPER ON

WIRE MANUFACTURE OR FABRICATION DURING THE YEAR

ALL members of the Wire Association are cordially invited to submit technical papers either for publication in "WIRE & WIRE PRODUCTS" during the year or for presentation before the Annual Wire Association Meeting at Cleveland, October 21-25, 1940.

CONSIDERATION for the Medal Award is not limited to the papers presented at the Annual Meeting, but is given to all papers submitted by members and published in "WIRE & WIRE PRODUCTS" during the year.

ADDITIONAL information may be obtained by addressing the undersigned.

RICHARD E. BROWN,

SECRETARY, THE WIRE ASSOCIATION

STAMFORD TRUST CO. BLDG. STAMFORD, CONNECTICUT

WHERE TO BUY

For more complete information, consult the annual Wire and Wire Products Directory, Index & Buyers' Guide.

ABRASIVES—
Norton Co., Worcester, Mass.

AIR DRAW FURNACES—
Carl-Mayer Corp., The,, Cleveland, Ohio.

ANNEALING MACHINES—Open Flame
Drever, Co., The, Philadelphia, Pa.
Syncro Machine Co., Rahway, N. J.

ANNEALING POTS AND BOXES—
Scudder, E. J., Fdry. & Machine Co., Trenton, N. J.

ANTI-RUST—Compound
Magnus Chemical Co., Garwood, N. J.
National Oil Products Co., Harrison, N. J.

ARMORING EQUIPMENT—
American Insulating Mach'y. Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

AUTOMATIC SPARK TESTING EQUIPMENT—
Entwistle, James L., Pawtucket, R. I.

BAKERS—Hi-Speed
Carl-Mayer Corp., The,, Cleveland, Ohio.

BAKERS—Rod and Wire
Carl-Mayer Corp., The,, Cleveland, Ohio.
Morgan Construction Co.. Worcester, Mass.
Moslo Machinery, Inc., Cleveland, O.
Ross, J. O., Engineering Corp., New York, N. Y.

BOBBINS—Braider and Wire Weaving
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.

BORON CARBIDE—
Norton Co., Worcester, Mass.

CARRIERS—Braider, High Speed
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.

CEMENT FLOOR CLEANER—
Magnus Chemical Co., Garwood, N. J.

CEMENTS—Refractory
Norton Co., Worcester, Mass.

CHEMICALS—Cleaning
American Chemical Paint Co., Ambler, Pa.
Magnus Chemical Co., Garwood, N. J.
Standard Industrial Compounds Co., Chicago, Ill.

CLEANERS—Hand and Metal
Magnus Chemical Co., Garwood, N. J.
Standard Industrial Compounds Co., Chicago, Ill.

CLEANING & PICKLING EQUIPMENT—
Broden Construction Co., Cleveland, O.
Cleveland Tramrail div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Hauser-Stander Tank Co., Cincinnati, O.
Lee Wilson Engineering Co., Cleveland, Ohio
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

CLOTH TESTERS—
Scott, Henry L., Co., Providence, R. I.

COATING—Protective
American Lanolin Corp., Lawrence, Mass.
National Oil Products Co., Harrison, N. J.

COILERS—Sheet, Strip and Wire
Broden Construction Co., Cleveland, O.
Farrel-Birmingham Co., inc., Ansonia, Conn.
Ruesch, H. J., Machine Co., Newark, N. J.
Torrington Mfg. Co., The, Torrington, Conn.

COILERS AND SPOOLERS FOR INSULATED WIRES—
Entwistle, James L., Pawtucket, R. I.

COMPOUNDS—Wire Drawing
Magnus Chemical Co., Garwood, N. J.
National Oil Products Co., Harrison, N. J.
Standard Industrial Compounds Co., Chicago, Ill.

COPHOLDERS—Steel
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.

CRANES—Wire Mill
Cleveland Tramrail div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio.
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

CUSTOM WIRE DRAWING—
Hy-Carbo Steel Co., Lowell, Mass.

CUTTERS—Wire
Porter, H. K., Co., The, Everett, Mass.

CUTTING TOOLS—Carbide
Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel Co., McKeesport, Pa.
Vascoloy-Ramet Corp., North Chicago, Ill.

DIAMOND POWDERS—
Rusch Wire Die Corp., New York, N. Y.

DIAMOND TOOLS—
Rusch Wire Die Corp., New York, N. Y.

DIES—Diamond
Cochaud Wire Die Co., New York, N. Y.
Kelly Wire Die Corp., New York, N. Y.
Krause & Co., Inc., F., Jersey City, N. J.
Rusch Wire Die Corp., New York, N. Y.
Vianney Wire Die Works, New York, N. Y.
Willey's Carbide Tool Co., Detroit, Mich.

DIES—Lead Extrusion
Robertson, John, Co., Brooklyn, N. Y.

DIES—Repairs & Re-Cutting
Carboloy Co., Inc., Detroit, Mich.
Cochaud Wire Die Co., New York, N. Y.
Firth-Sterling Steel Co., McKeesport, Pa.
Kelly Wire Die Corp., New York, N. Y.
Krause & Co., Inc., F., Jersey City, N. J.
Rusch Wire Die Corp., New York, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Vianney Wire Die Works, New York, N. Y.
Willey's Carbide Tool Co., Detroit, Mich.

DIES—Rod and Tube Drawing
Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel Co., McKeesport, Pa.
Kelly Wire Die Corp., New York, N. Y.
Rusch Wire Die Corp., New York, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Vianney Wire Die Works, New York, N. Y.
Willey's Carbide Tool Co., Detroit, Mich.

DIES—Tantalum Carbide
Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel Co., McKeesport, Pa.
Kelly Wire Die Corp., New York, N. Y.
Rusch Wire Die Corp., New York, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Vianney Wire Die Works, New York, N. Y.

DIES—Tungsten Carbide
Carboloy Co., Inc., Detroit, Mich.
Firth-Sterling Steel Co., McKeesport, Pa.
Kelly Wire Die Corp., New York, N. Y.
Rusch Wire Die Corp., New York, N. Y.
Vascoloy-Ramet Corp., North Chicago, Ill.
Vianney Wire Die Works, New York, N. Y.
Willey's Carbide Tool Co., Detroit, Mich.

DRAW BENCHES—
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry. & Machine Co., Trenton, N. J.
Standard Machinery Co., Providence, R. I.
Vaughn Machinery Co., Cuyahoga Falls, O.

DRUMS—Flange Steel
Stevens Metal Products Co., Niles, O.

DRUMS—Vulcanizing
Mossberg Pressed Steel Corp., Attleboro, Mass.

ENGINEERS—Consulting Wire Mill
Hartley, George D., Worcester, Mass.
Lewis, Kenneth B., Worcester, Mass.

EQUIPMENT—Insulation Testing
Entwistle, James L., Pawtucket, R. I.

EYELETS—Brass or Zinc
Platt Bros. & Co., The, Waterbury, Conn.

FURNACES—Annealing
Bellis Heat Treating Co., Branford, Conn.
Carl-Mayer Corp., The,, Cleveland, Ohio.
Drever, Co., The, Philadelphia, Pa.
Electric Furnace Co., Salem, O.
Lee Wilson Engineering Co., Cleveland, Ohio
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Automatic
Bellis Heat Treating Co., Branford, Conn.
Carl-Mayer Corp., The,, Cleveland, Ohio.
Electric Furnace Co., Salem, O.
Lee Wilson Engineering Co., Cleveland, Ohio
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Brazing
Electric Furnace Co., Salem, O.
Firth-Sterling Steel Co., McKeesport, Pa.

FURNACES—Bright Annealing
Bellis Heat Treating Co., Branford, Conn.
Electric Furnace Co., Salem, O.
Lee Wilson Engineering Co., Cleveland, Ohio
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Electric
Bellis Heat Treating Co., Branford, Conn.
Electric Furnace Co., Salem, O.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Hardening and Tempering
Carl-Mayer Corp., The,, Cleveland, Ohio.
Electric Furnace Co., Salem, O.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Lead Melting
Electric Furnace Co., Salem, O.
Robertson, John, Co., Brooklyn, N. Y.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Non-Oxidizing
Bellis Heat Treating Co., Branford, Conn.
Carl-Mayer Corp., The, Cleveland, Ohio.
Electric Furnace Co., Salem, O.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Normalizing
Carl-Mayer Corp., The,, Cleveland, Ohio.
Electric Furnace Co., Salem, O.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Salt Bath
Electric Furnace Co., Salem, O.
Surface Combustion Corp., Toledo, Ohio.

FURNACES—Wire, Strip & Sheet
Bellis Heat Treating Co., Branford, Conn.
Carl-Mayer Corp., The,, Cleveland, Ohio.
Electric Furnace Co., Salem, O.
Lee Wilson Engineering Co., Cleveland, Ohio
Surface Combustion Corp., Toledo, Ohio.

GALVANIZING EQUIPMENT—
Lee Wilson Engineering Co., Cleveland, Ohio

GEARS—Wire Mill
Farrel-Birmingham Co., Inc., Ansonia, Conn.

GRINDERS—Roll
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Norton Co., Worcester, Mass.

HI-SPEED BAKERS—
Carl-Mayer Corp., The,, Cleveland, Ohio.

HOISTS—Electric Travelling
Cleveland Tramrail div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio.

INHIBITORS—
American Chemical Paint Co., Ambler, Pa.
National Oil Products Co., Harrison, N. J.

INSTRUMENTS—Electrical
Entwistle, James L., Pawtucket, R. I.

LATHES—Die Reaming
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

LUBRICANTS—For Metal Cutting, Stamping and Drawing
Magnus Chemical Co., Garwood, N. J.
National Oil Products Co., Harrison, N. J.
Standard Industrial Compounds Co., Chicago, Ill.

LUBRICANTS—Wire Drawing
Magnus Chemical Co., Garwood, N. J.
National Oil Products Co., Harrison, N. J.
Standard Industrial Compounds Co., Chicago, Ill.

MACHINERY — Armoring (Cable, Wire Hose)
American Insulating Mach'y. Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Robertson, John, Co., Brooklyn, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Thomson-Judd Wire Machinery Co., Sub. of Thomson-Gibb Electric Welding Co., Lynn, Mass.
Torrington Mfg. Co., The, Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Braiding
Fidelity Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Brazing
Thomson-Judd Wire Machinery Co., Sub. of Thomson-Gibb Electric Welding Co., Lynn, Mass

MACHINERY—Bunching
American Insulating Mach'y. Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Bundling, Scrap
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.
Watson Machine Co., Paterson, N. J.

MACHINERY—Cable, Electric
American Insulating Mach'y. Co., Phila., Pa.
Entwistle, James L., Pawtucket, R. I.
Fidelity Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.
Thomson-Judd Wire Machinery Co., Sub. of Thomson-Gibb Electric Welding Co., Lynn, Mass
Torrington Mfg. Co., The, Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Chain Making
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Closing
New England Butt Co., Providence, R. I.
Torrington Mfg. Co., The, Torrington, Conn.
Watson Machine Co., Paterson, N. J.

WHERE TO BUY, Continued

MACHINERY—Coil Winding
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., The, Torrington, Conn.

MACHINERY—Coilers
Broden Construction Co., Cleveland, O.
Entwistle, James L., Pawtucket, R. I.
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Morgan Construction Co., Worcester, Mass.
New England Butt Co., Providence, R. I.
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., The, Torrington, Conn.
Waterbury-Farrel Fdry. & Machine Co., Waterbury, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Copper Wire Drawing and Rolling
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Ruesch, H. J., Machine Co., Newark, N. J.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., The, Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Machine Co., Waterbury, Conn.

MACHINERY—Covering Wire
Fidelity Machine Co., Philadelphia, Pa.
Syncro Machine Co., Rahway, N. J.

MACHINERY—Cutting
Broden Construction Co., Cleveland, O.
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Hallden Machine Co., Thomaston, Conn.
Lewis Machine Co., The, Cleveland, O.
Moslo Machinery, Inc., Cleveland, O.
National Machinery Exchange (Used), New York, N. Y.
Shuster, F. B., Co., New Haven, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.

MACHINERY—Die Making
Firth-Sterling Steel Co., McKeesport, Pa.

MACHINERY—Draw Benches
Standard Machinery Co., Providence, R. I.

MACHINERY—Edging
Standard Machinery Co., Providence, R. I.

MACHINERY—Enameling
American Insulating Mach'y. Co., Phila., Pa.
Syncro Machine Co., Rahway, N. J.

MACHINERY—Extruding
Robertson, John, Co., Brooklyn, N. Y.
Royle, John & Sons, Paterson, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Flat Wire
Broden Construction Co., Cleveland, O.
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., The, Torrington, Conn.

MACHINERY—Forming
National Machinery Exchange (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Providence, R. I.
Torrington Mfg. Co., The, Torrington, Conn.

MACHINERY—Galvanizing
Lee Wilson Engineering Co., Cleveland, Ohio

MACHINERY—Galvanizing Wire
Broden Construction Co., Cleveland, O.
Lee Wilson Engineering Co., Cleveland, Ohio
Sleeper & Hartley, Inc., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Gang Winders
Fidelity Machine Co., Philadelphia, Pa.
Ruesch, H. J., Machine Co., Newark, N. J.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Grinding
Norton Co., Worcester, Mass.

MACHINERY—Insulating
American Insulating Mach'y. Co., Phila., Pa.
Fidelity Machine Co., Philadelphia, Pa.
National Rubber Machinery Co., Akron, O.
New England Butt Co., Providence, R. I.
Royle, John & Sons, Paterson, N. J.
Syncro Machine Co., Rahway, N. J.
Watson Machine Co., Paterson, N. J.

MACHINERY—Knitting
Fidelity Machine Co., Philadelphia, Pa.

MACHINERY—Lead Encasing
Robertson, John, Co., Brooklyn, N. Y.

MACHINERY—Lead Stripping
Robertson, John, Co., Brooklyn, N. Y.
Watson Machine Co., Paterson, N. J.

MACHINERY—Lock Washer
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., The, Torrington, Conn.

MACHINERY—Magnet Wire
American Insulating Mach'y. Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., The, Torrington, Conn.

MACHINERY—Material Handling
Cleveland Tramrail div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio.

MACHINERY — Measuring Wire & Cable
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Nail and Tack
Glader, Wm., Machine Works Co., Chicago, Ill.
National Machinery Exchange (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Panning
American Insulating Mach'y. Co., Phila., Pa.
Syncro Machine Co., Rahway, N. J.

MACHINERY—Pointing
Broden Construction Co., Cleveland, O.
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry. & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., The, Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Machine Co., Waterbury, Conn.

MACHINERY—Rod Mill
Broden Construction Co., Cleveland, O.
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Morgan Construction Co., Worcester, Mass.
Ruesch, H. J., Machine Co., Newark, N. J.

MACHINERY—Rolling Mill
Broden Construction Co., Cleveland, O.
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Morgan Construction Co., Worcester, Mass.
National Machinery Exchange (Used), New York, N. Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Standard Machinery Co., Providence, R. I.
Syncro Machine, Rahway, N. J.
Torrington Mfg. Co., The, Torrington, Conn.
Waterbury-Farrel Fdry. & Machine Co., Waterbury, Conn.

MACHINERY—Rubber for Insulating Wire
Farrel-Birmingham Co., Inc., Ansonia, Conn.
National Rubber Machinery Co., Akron, O.
Royle, John & Sons, Paterson, N. J.

MACHINERY—Rubber Strip Covering
Farrel-Birmingham Co., Inc., Ansonia, Conn.
National Rubber Machinery Co., Akron, O.
New England Butt Co., Providence, R. I.
Watson Machine Co., Paterson, N. J.

MACHINERY—Rubber Tubing and Straining
Farrel-Birmingham Co., Inc., Ansonia, Conn.
National Rubber Machinery Co., Akron, O.
New England Butt Co., Providence, R. I.
Royle, John, & Sons, Paterson, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., The, Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Screw Wire
National Machinery Exchange (Used), New York, N. Y.
Sleeper & Hartley, Worcester, Mass.

MACHINERY—Special
American Insulating Mach'y. Co., Phila., Pa.
Broden Construction Co., Cleveland, O.
National Rubber Machinery Co., Akron, O.
New England Butt Co., Providence, R. I.
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry. & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Providence, R. I. (Special Designs)
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., The, Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Spooling
American Insulating Mach'y. Co., Phila., Pa.
Fidelity Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., The, Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Machine Co., Waterbury, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Spring Making
National Machinery Exchange (Used), New York, N. Y.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., The, Torrington, Conn.

MACHINERY—Staple
Sleeper & Hartley, Inc., Worcester, Mass.

MACHINERY—Straightening
Broden Construction Co., Cleveland, O.
Hallden Machine Co., Thomaston, Conn.
Lewis Machine Co., The, Cleveland, O.
Moslo Machinery, Inc., Cleveland, O.
National Machinery Exchange (Used), New York, N. Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Shuster, F. B., Co., New Haven, Conn.
Sleeper & Hartley, Inc., Worcester, Mass.
Torrington Mfg. Co., The, Torrington, Conn.

MACHINERY—Stranding
National Rubber Machinery Co., Akron, O.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Thomson-Judd Wire Machinery Co., Sub. of Thomson-Gibb Electric Welding Co., Lynn, Mass
Torrington Mfg. Co., The, Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Strip Steel
Broden Construction Co., Cleveland, O.
Ruesch, H. J., Machine Co., Newark, N. J.
Torrington Mfg. Co., The, Torrington, Conn.

MACHINERY—Swaging
National Machinery Exchange (Used), New York, N. Y.
Ruesch, H. J., Machine Co., Newark, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Providence, R. I.
Syncro Machine, Rahway, N. J.
Waterbury-Farrel Fdry. & Machine Co., Waterbury, Conn.

MACHINERY—Taping
American Insulating Mach'y. Co., Phila., Pa.
Fidelity Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.
Thomson-Judd Wire Machinery Co., Sub. of Thomson-Gibb Electric Welding Co., Lynn, Mass
Torrington Mfg. Co., The, Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Testing
Entwistle, James L., Pawtucket, R. I.
Scott, Henry L., Co., Providence, R. I.

MACHINERY—Testing Size of Wire
Torrington Mfg. Co., The, Torrington, Conn.

MACHINERY—Testing—Spring
Standard Machinery Co., Providence, R. I.

MACHINERY—Tinsel Rolling Mills
American Insulating Mach'y. Co., Phila., Pa.
Syncro Machine Co., Rahway, N. J.

MACHINERY—Trolley Wire
Vaughn Machinery Co., Cuyahoga Falls, O.

MACHINERY—Tube Mill
Ruesch, H. J., Machine Co., Newark, N. J.
Torrington Mfg. Co., The, Torrington, Conn.

MACHINERY—Welding Wire
Eisler Engineering Co., Inc., Newark, N. J.
Micro Products Co., Chicago, Ill.
Shuster, F. B., Co., New Haven, Conn.
Thomson-Judd Wire Machinery Co., Sub. of Thomson-Gibb Electric Welding Co., Lynn, Mass.

MACHINERY—Winding
American Insulating Mach'y. Co., Phila., Pa.
Entwistle, James L., Pawtucket, R. I.
Fidelity Machine Co., Philadelphia, Pa.
New England Butt Co., Providence, R. I.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., The, Torrington, Conn.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Drawing
American Insulating Mach'y. Co., Phila., Pa.
Broden Construction Co., Cleveland, O.
Morgan Construction Co., Worcester, Mass.
National Machinery Exchange (Used), New York, N. Y.
Reactive Wire Drawing, Worcester, Mass.
Ruesch, H. J., Machine Co., Newark, N. J.
Scudder, E. J., Fdry. & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.
Standard Machinery Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.
Thomson-Judd Wire Machinery Co., Sub. of Thomson-Gibb Electric Welding Co., Lynn, Mass.
Torrington Mfg. Co., The, Torrington, Conn.
Vaughn Machinery Co., Cuyahoga Falls, O.
Waterbury-Farrel Fdry. & Machine Co., Waterbury, Conn.

WHERE TO BUY, Continued

MACHINERY—Wire Measuring
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Rope
National Rubber Machinery Co., Akron, O.
New England Butt Co., Providence, R. I.
Thomson-Judd Wire Machinery Co., Sub. of Thomson-Gibb Electric Welding Co., Lynn, Mass.
Watson Machine Co., Paterson, N. J.

MACHINERY—Wire Tinning
American Insulating Mach'y. Co., Phila., Pa.
New England Butt Co., Providence, R. I.
Syncro Machine Co., Rahway, N. J.

MACHINERY—Wood Screw
National Machinery Exchange (Used), New York, N. Y.

MATERIAL HANDLING EQUIPMENT—
Cleveland Tramrail div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio.

MILLS—Tandem Rolling and Edging
Standard Machinery Co., Providence, R. I.
Torrington Mfg. Co., The, Torrington, Conn.

NICKEL SILVER AND PHOSPHOR BRONZE—Rod, Wire and Strip
Hudson Wire Co., Ossining, N. Y.

OILS—Wire Drawing
National Oil Products Co., Harrison, N. J.
Standard Industrial Compounds Co., Chicago, Ill.

OVENS—Industrial
Carl-Mayer Corp., Cleveland, Ohio.
Ross Engineering Corp., J. O., New York, N. Y.

PANS—Vulcanizing
Mossberg Pressed Steel Corp., Attleboro, Mass.

PAPER TESTERS—
Scott, Henry L., Co., Providence, R. I.

PATENT ATTORNEYS—
Lancaster, Allwine and Rommel, Washington, D. C.

PICKLING COMPOUNDS—
American Chemical Paint Co., Ambler, Pa.
National Oil Products Co., Harrison, N. J.

PLASTIC TESTERS—
Scott, Henry L., Co., Providence, R. I.

POTS—Lead Melting
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Robertson, John, Co., Brooklyn, N. Y.

PRESSES—Hydraulic and Mechanical
Farrel-Birmingham Co., Inc., Ansonia, Conn.
Robertson, John, Co., Brooklyn, N. Y.
Standard Machinery Co., Providence, R. I. (Mechanical Only)

PRESSES—Lead
Robertson, John, Co., Brooklyn, N. Y.

PULLERS—Wire
Scudder, E. J., Fdry. & Machine Co., Trenton, N. J.
Sleeper & Hartley, Inc., Worcester, Mass.

PUMPS—Hydraulic
Robertson, John, Co., Brooklyn, N. Y.

REACTIVE WIRE DRAWING
Reactive Wire Drawing, Worcester, Mass.

RECORDERS—Fault and Reel
Entwistle, James L., Pawtucket, R. I.

REEL AND TENSION STAND—
Fidelity Machine Co., Philadelphia, Pa.
Moslo Machinery, Inc., Cleveland, O.
Sleeper & Hartley, Inc., Worcester, Mass.
Syncro Machine Co., Rahway, N. J.
Torrington Mfg. Co., The, Torrington, Conn.

REEL CRUTCHES—
Watson Machine Co., Paterson, N. J.

REELS—Annealing and Stranding
Apco Mossberg Co., Attleboro, Mass.
Moslo Machinery, Inc., Cleveland, O.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Shuster, F. B., Co., New Haven, Conn.
Stevens Metal Products Co., Niles, O.

REELS—Steel
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

REELS AND SPOOLS—Shipping and Shop
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, Ohio.

REELS—Takeoff
Apco Mossberg Co., Attleboro, Mass.
Moslo Machinery, Inc., Cleveland, O.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Shuster, F. B., Co., New Haven, Conn.
Stevens Metal Products Co., Niles, O.

REELS—Vulcanizing and Impregnating
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Shuster, F. B., Co., New Haven, Conn.
Stevens Metal Products Co., Niles, O.

REELS—Wire Drawing
Apco Mossberg Co., Attleboro, Mass.
Moslo Machinery, Inc., Cleveland, O.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

REFRACTORIES—High Temperature
Norton Co., Worcester, Mass.

ROD BAKERS—
Carl-Mayer Corp., The, Cleveland, Ohio.
Moslo Machinery, Inc., Cleveland, O.
Ross, J. O., Engineering Corp., New York, N. Y.

RODS—Wire—Non-Ferrous
Hudson Wire Co., Ossining, N. Y.
Platt Bros. & Co., The, Waterbury, Conn.

RODS—Wire—Steel
Bethlehem Steel Co., Bethlehem, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.

ROLL STRAIGHTENERS—
Moslo Machinery, Inc., Cleveland, O.

ROLLS—
Farrel-Birmingham Co., Inc., Ansonia, Conn.

RUBBER AND RUBBER COMPRESSION TESTERS—
Scott, Henry L., Co., Providence, R. I.

RUST PROOF COMPOUND—
American Lanolin Co., Lawrence, Mass.

SHEET—Steel
Jones & Laughlin Steel Corp., Pittsburgh, Pa.

SKIN PROTECTOR—
Magnus Chemical Co., Garwood, N. J.

SOAPS—Industrial and Wire Drawing
Magnus Chemical Co., Garwood, N. J.
National Oil Products Co., Harrison, N. J.
Standard Industrial Compounds Co., Chicago, Ill.

SPARK TESTING EQUIPMENT—
Entwistle, James L., Pawtucket, R. I.

SPOOLS—Annealing and Wire Drawing
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Chicago, Ill.

SPOOLS—Shipping and Shop
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

SPOOLS—Steel
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.
Stevens Metal Products Co., Niles, O.

STAMPINGS—Steel
Mossberg Pressed Steel Corp., Attleboro, Mass.

STRIP—Brass and Non Ferrous
Hudson Wire Co., Ossining, N. Y.

STRIP—Steel
Bethlehem Steel Corp., Bethlehem, Pa.
Firth-Sterling Steel Co., McKeesport, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Pittsburgh Steel Corp., Pittsburgh, Pa.

STRIP METAL TESTERS—
Scott, Henry L., Co., Providence, R. I.

SWIFTS—Take-off
Apco Mossberg Co., Attleboro, Mass.
Mossberg Pressed Steel Corp., Attleboro, Mass.

TAKE-UPS FOR CABLE, HOSE, LEAD PRESSES AND SHEET RUBBER—
Entwistle, James L., Pawtucket, R. I.

TANKS—Acid
Hauser-Stander Tank Co., Cincinnati, O.

TANKS—Compound
Watson Machine Co., Paterson, N. J.

TANKS—Lead Lined
Hauser-Stander Tank Co., Cincinnati, O.

TANKS—Pickling
Hauser-Stander Tank Co., Cincinnati, O.

TANKS—Rubber Lined
Hauser-Stander Tank Co., Cincinnati, O.

TANKS—Steel
Mossberg Pressed Steel Corp., Attleboro, Mass.

TANKS—Wooden
Hauser-Stander Tank Co., Cincinnati, O.

TENSILE TESTERS—
Scott, Henry L., Co., Providence, R. I.

TESTING INSTRUMENTS—
Entwistle, James L., Providence, R. I.
Scott, Henry L., Co., Providence, R. I.

TOOLS—Wire Cutting
Porter, H. K., Co., The, Everett, Mass.

TRAMRAIL SYSTEMS—
Cleveland Tramrail div. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio.

TREADS—Safety
Norton Co., Worcester, Mass.

TRUCKS—
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., Cuyahoga Falls, O.

TUBE BENDERS AND FORMERS—
Ruesch, H. J., Machine Co., Newark, N. J.

TURKS HEAD—Friction and Power Driven
Standard Machinery Co., Providence, R. I.

VULCANIZERS—
Watson Machine Co., Paterson, N. J.

VULCANIZING PANS—
American Insulating Mach'y. Co., Phila., Pa.
Mossberg Pressed Steel Corp., Attleboro, Mass.

WELDERS—Spot and Butt
Eisler Engineering Co., Newark, N. J.
Micro Products Co., Chicago, Ill.
Moslo Machinery, Inc., Cleveland, O.

WIRE—Cold Heading
Bethlehem Steel Co., Bethlehem, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.

WIRE DRAWING—High Grade Custom
Hy-Carbo Steel Co., Lowell, Mass.

WIRE—Electric
Hudson Wire Co., Ossining, N. Y.

WIRE—Enameled For Coils
Winsted Div. of Hudson Wire Co., Winsted, Conn.

WIRE—Manufacturers
Bethlehem Steel Co., Bethlehem, Pa.
Firth-Sterling Steel Co., McKeesport, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.

WIRE—Nickel Silver and Phosphor Bronze
Hudson Wire Co., Ossining, N. Y.

WIRE—Non Ferrous to Specification For Special Purposes
Hudson Wire Co., Ossining, N. Y.
Winsted Div. of Hudson Wire Co., Winsted, Conn.

WIRE—Spring
Bethlehem Steel Co., Bethlehem, Pa.
Firth-Sterling Steel Co., McKeesport, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.

WIRE—Stainless Steel—
Firth-Sterling Steel Co., McKeesport, Pa.

WIRE—Steel—Also Coppered Steel—Also Galvanized Steel
Bethlehem Steel Co., Bethlehem, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Pittsburgh Steel Co., Pittsburgh, Pa.

WIRE AND STRIP—Zinc
Platt Bros. & Co., The, Waterbury, Conn.

WIRE TESTERS—
Scott, Henry L., Co., Providence, R. I.

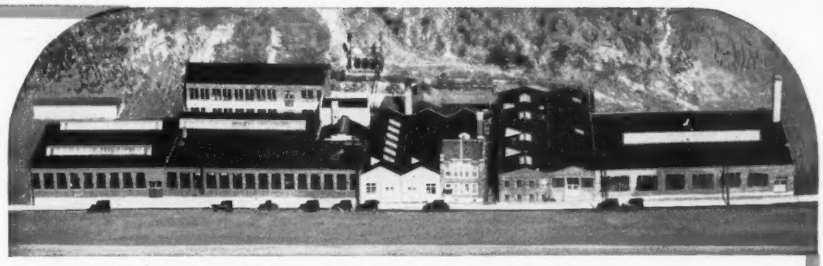
WIRE, WEAVING—Non Ferrous
Hudson Wire Co., Ossining, N. Y.

YARN TESTERS—
Scott, Henry L., Co., Providence, R. I.

HUDCO

SPECIALIZES

WINCO



HUDSON WIRE CO. PLANT AT OSSINING, N. Y.

HUDCO AT OSSINING PRODUCES FINE WIRES IN ALL METALS.

FINE BARE WIRES

High Brass, Low Brass, Zinc 99.99+ and High Tensile Zinc, Commercial Bronze, Phosphor Bronze, Pure Tin, Lead, Antimonial Lead, Tinsel Lahns, Silver Plated Copper, False Gold and Copper.

Cadmium, Nickel Silver, 10%, 18%, and 30%; Silver Plated Copper, False Gold and Special Brass and Bronze Alloys to Specification, Metallic Fibre for Packing Purposes, Copper, Bronze, Zinc, Lead and Aluminum.

WIRES FOR METAL SPRAYING

Pure Lead, Lead Alloy, Pure Zinc, Zinc Alloy, Copper, Tin, High Brass, Low Brass, Solder Wire, High Conductivity, Electric Wire.

Cadmium, Nickel Silver, (10%, 18%, 30%); Aluminum, Monel Metal, Phosphor Bronze, Pure Nickel, Commercial Bronze.

"HUDCO" SPECIALLY PROCESSED COPPER WIRE FOR ENAMELLING PURPOSES IS DRAWN FROM SELECTED COPPER, INSURING THE MAXIMUM CONDUCTIVITY. THIS SELECTION PLUS OUR LONG EXPERIENCE AND UNEXCELLED PLANT FACILITIES INSURE OUR CUSTOMER BETTER WIRE AT LOWER COST.

WRITE TODAY FOR SAMPLES AND PRICES —

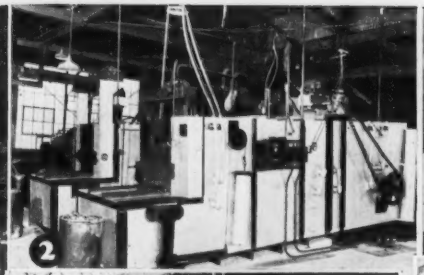
HUDSON WIRE COMPANY
OSSINING, N. Y.

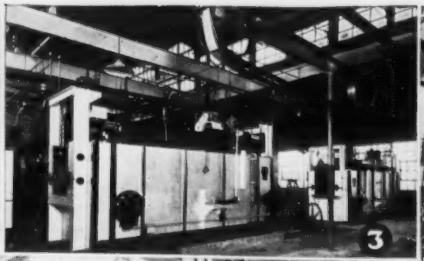
ESTAB. 1902 SUCCESSORS - ROYLE AND AKIN

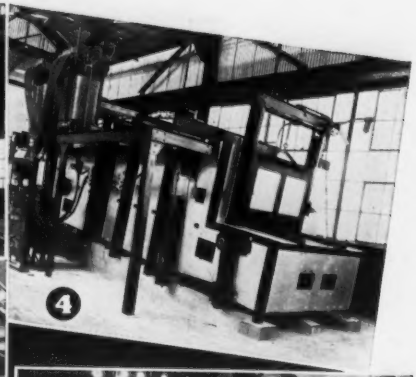
WINCO AT WINSTED, CONN. PRODUCES LEAKPROOF ENAMELLED WIRE AND OTHER WINCO ENAMELLED AND COVERED WIRES.

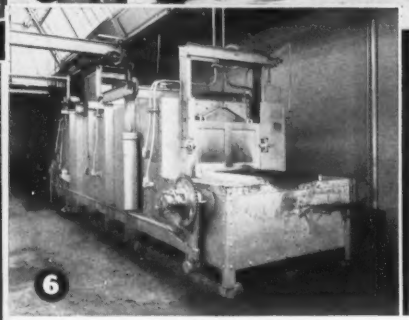
WRITE FOR SAMPLES AND PRICES —

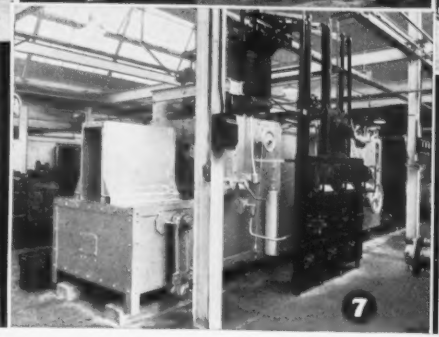
WINSTED DIVISION
HUDSON WIRE COMPANY
WINSTED CONNECTICUT

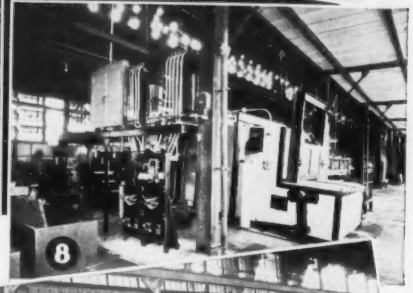


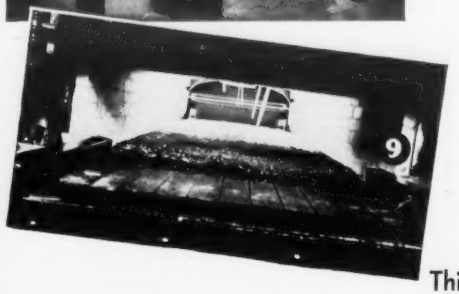












Some EF Continuous Chain Belt Conveyor Furnaces for

Heat Treating

Bolts, Springs, Bearing Parts and Other Small and Medium Size Products.

Uniformly - Economically - Continuously

This type also built for scale-free hardening - - - without decarburizing

The 10 views above show 16 EF continuous chain belt conveyor furnaces—all handling bearing parts—a few of the numerous installations of this type furnace we have made for the uniform, economical heat-treatment of miscellaneous small and medium size parts and products. Over 100 of these furnaces now in operation - - - with capacities ranging from 300 to 1700 lbs. per hour.

Other EF Chain Belt installations are handling bolts, nuts, rivets, springs, sprockets, forgings and many other products ranging in size from small screws to large crawler links for tractors. These furnaces may be electrically heated or gas fired and designed for using protective atmospheres for scale-free heat treating and hardening without decarburization.

THE ELECTRIC FURNACE CO., Oil, Gas and Electric Furnaces SALEM, OHIO